

Multivariable meta-regression results

I. R code - start

```
#### multivariable regression of different moderators
library(readr)
mrnew.dat <- read_csv("MRnewposit.csv")

View(mrnew.dat)
is.data.frame(mrnew.dat)

s <- spec(mrnew.dat)
s

summary(mrnew.dat)

any(is.na(mrnew.dat))

head(mrnew.dat)

### source of the following r codes:
https://wviechthb.github.io/metafor/reference/regplot.html;
https://wviechthb.github.io/metafor/

### copy mrnew data into 'dat'
dat <- mrnew.dat

### calculate log risk ratios and corresponding sampling variances
dat <- escalc(measure="RR", ai=m.e, bi=m.ne, ci=f.e, di=f.ne,
data=dat)
```

II. Comorbidities

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Diabetes + Cancers

```
### fit mixed-effects model with diabetes and cancers as moderators
res <- rma(yi, vi, mods = ~ diabetes.rel + cancers.rel, data=dat)
res
```

Mixed-Effects Model (k = 10; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0234)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

Test for Residual Heterogeneity:
QE(df = 7) = 3.5003, p-val = 0.8352

Test of Moderators (coefficients 2:3):
QM(df = 2) = 3.0652, p-val = 0.2160

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.4444	0.1246	3.5674	0.0004	0.2003	0.6886

```

diabetes.rel    -2.5758  1.5041  -1.7125  0.0868  -5.5238
0.3722      .
cancers.rel     4.6123  4.3038   1.0717  0.2839  -3.8231  13.0476
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = HIV + Diabetes

```

### fit mixed-effects model with diabetes and cancers as moderators
res <- rma(yi, vi, mods = ~ hivaid.rel + diabetes.rel, data=dat)
res

```

Mixed-Effects Model (k = 13; tau² estimator: REML)

```

tau^2 (estimated amount of residual heterogeneity):    0 (SE =
0.0179)
tau (square root of estimated tau^2 value):           0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):  1.00
R^2 (amount of heterogeneity accounted for):           0.00%

```

Test for Residual Heterogeneity:
QE(df = 10) = 4.3015, p-val = 0.9327

Test of Moderators (coefficients 2:3):
QM(df = 2) = 2.5186, p-val = 0.2839

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.5355	0.0938	5.7109	<.0001	0.3517	0.7193	***
hivaid.rel	-0.2747	0.3691	-0.7442	0.4567	-0.9981	0.4487	
diabetes.rel	-1.7970	1.2549	-1.4320	0.1521	-4.2566	0.6625	

```

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

```

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = HIV + Hepcirrh

```

### fit mixed-effects model with diabetes and cancers as moderators
res <- rma(yi, vi, mods = ~ hivaid.rel + hepcirrh.rel, data=dat)
res

```

Mixed-Effects Model (k = 9; tau² estimator: REML)

```

tau^2 (estimated amount of residual heterogeneity):    0 (SE =
0.0329)
tau (square root of estimated tau^2 value):           0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):  1.00
R^2 (amount of heterogeneity accounted for):           100.00%

```

Test for Residual Heterogeneity:
QE(df = 6) = 2.5944, p-val = 0.8578

Test of Moderators (coefficients 2:3):
QM(df = 2) = 2.8090, p-val = 0.2455

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4802	0.0987	4.8653	<.0001	0.2868	0.6737	***
hivaids.rel	0.3750	0.4557	0.8228	0.4106	-0.5182	1.2683	
hepcirrh.rel	-1.0488	0.8443	-1.2423	0.2141	-2.7035	0.6059	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = HIV + Cancers

```
### fit mixed-effects model with hivaids and cancers as moderators
res <- rma(yi, vi, mods = ~ hivaids.rel + cancers.rel, data=dat)
res
```

Mixed-Effects Model (k = 9; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0.0050 (SE = 0.0217)
tau (square root of estimated tau² value): 0.0707
I² (residual heterogeneity / unaccounted variability): 10.92%
H² (unaccounted variability / sampling variability): 1.12
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 6) = 4.5498, p-val = 0.6027

Test of Moderators (coefficients 2:3):
QM(df = 2) = 1.1770, p-val = 0.5551

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3139	0.1296	2.4230	0.0154	0.0600	0.5678	*
hivaids.rel	-2.1181	2.2386	-0.9461	0.3441	-6.5057	2.2696	
cancers.rel	6.3873	6.0621	1.0536	0.2920	-5.4942	18.2687	

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = HIV + Others

```
### fit mixed-effects model with hivaids and other as moderators
res <- rma(yi, vi, mods = ~ hivaids.rel + other.rel, data=dat)
res
```

Mixed-Effects Model (k = 10; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0200)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 7) = 2.0987, p-val = 0.9542

Test of Moderators (coefficients 2:3):
QM(df = 2) = 4.3210, p-val = 0.1153

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4787	0.0921	5.1978	<.0001	0.2982	0.6591	***
hiv aids.rel	1.7799	1.6825	1.0579	0.2901	-1.5177	5.0775	
other.rel	-1.3035	0.6487	-2.0095	0.0445	-2.5749	-0.0321	*

Signif. Codes: 0 '****' 0.001 '***' 0.01 '**' 0.05 '.' 0.1 ' ' 1

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Diabetes + Hepcirrh

```
### fit mixed-effects model with diabetes and hepcirrh as moderators
res <- rma(yi, vi, mods = ~ diabetes.rel + hepcirrh.rel, data=dat)
res
```

Mixed-Effects Model (k = 9; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0497)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 100.00%

Test for Residual Heterogeneity:

QE(df = 6) = 1.5913, p-val = 0.9532

Test of Moderators (coefficients 2:3):

QM(df = 2) = 3.4995, p-val = 0.1738

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.5697	0.1279	4.4533	<.0001	0.3189	0.8204	***
diabetes.rel	-1.6312	2.0324	-0.8026	0.4222	-5.6147	2.3523	
hepcirrh.rel	-0.7673	0.7567	-1.0141	0.3105	-2.2504	0.7157	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Diabetes + Other

```
### fit mixed-effects model with diabetes and other as moderators
res <- rma(yi, vi, mods = ~ diabetes.rel + other.rel, data=dat)
res
```

Mixed-Effects Model (k = 12; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0194)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:

QE(df = 9) = 5.7465, p-val = 0.7650

Test of Moderators (coefficients 2:3):

QM(df = 2) = 2.8827, p-val = 0.2366

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.5209	0.0947	5.4986	<.0001	0.3352	0.7066	***
diabetes.rel	-1.3597	1.6991	-0.8002	0.4236	-4.6899	1.9705	
other.rel	-0.3622	0.5859	-0.6183	0.5364	-1.5106	0.7861	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Cancers + Hepcirrh

```
### fit mixed-effects model with cancers and hepcirrh as moderators
res <- rma(yi, vi, mods = ~ cancers.rel + hepcirrh.rel, data=dat)
res
```

Mixed-Effects Model (k = 5; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.1061)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 2) = 0.1289, p-val = 0.9376

Test of Moderators (coefficients 2:3):
QM(df = 2) = 1.7929, p-val = 0.4080

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.5857	0.1793	3.2664	0.0011	0.2343	0.9372	**
cancers.rel	-2.4072	5.8109	-0.4143	0.6787	-13.7964	8.9820	
hepcirrh.rel	-0.9783	0.9129	-1.0716	0.2839	-2.7675	0.8109	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Cancers + Other

```
### fit mixed-effects model with cancers and other as moderators
res <- rma(yi, vi, mods = ~ cancers.rel + other.rel, data=dat)
res
```

Mixed-Effects Model (k = 9; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0215)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:

QE(df = 6) = 4.6590, p-val = 0.5882

Test of Moderators (coefficients 2:3):

QM(df = 2) = 1.8396, p-val = 0.3986

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3876	0.1210	3.2026	0.0014	0.1504	0.6248	**
cancers.rel	4.7963	4.7156	1.0171	0.3091	-4.4461	14.0388	
other.rel	-1.0433	0.7942	-1.3137	0.1890	-2.5998	0.5133	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Hepcirrh + Other

```
### fit mixed-effects model with hepcirrh and other as moderators  
res <- rma(yi, vi, mods = ~ hepcirrh.rel + other.rel, data=dat)  
res
```

Mixed-Effects Model (k = 6; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0558)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 100.00%

Test for Residual Heterogeneity:

QE(df = 3) = 0.7932, p-val = 0.8511

Test of Moderators (coefficients 2:3):

QM(df = 2) = 3.4308, p-val = 0.1799

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.5850	0.1224	4.7802	<.0001	0.3452	0.8249	***
hepcirrh.rel	-0.4287	1.0846	-0.3952	0.6927	-2.5545	1.6971	
other.rel	-0.7455	0.6833	-1.0910	0.2753	-2.0847	0.5938	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = HIV + Diabetes + Cancers

```
### fit mixed-effects model with hiv aids, diabetes and cancers as  
moderators  
res <- rma(yi, vi, mods = ~ hiv aids.rel + diabetes.rel + cancers.rel,  
data=dat)  
res
```

Mixed-Effects Model (k = 8; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0342)

```
tau (square root of estimated tau^2 value):      0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for):      0.00%
```

```
Test for Residual Heterogeneity:
QE(df = 4) = 0.7192, p-val = 0.9489
```

```
Test of Moderators (coefficients 2:4):
QM(df = 3) = 3.4854, p-val = 0.3227
```

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4492	0.1386	3.2415	0.0012	0.1776	0.7209	**
hivaids.rel	-1.9064	2.1145	-0.9016	0.3673	-6.0508	2.2380	
diabetes.rel	-2.3894	1.5251	-1.5667	0.1172	-5.3785	0.5997	
cancers.rel	7.9165	6.0012	1.3192	0.1871	-3.8456	19.6786	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = HIV + Diabetes + Hepcirrh

fit mixed-effects model with hivaids, diabetes and hepcirrh as moderators

```
res <- rma(yi, vi, mods = ~ hivaids.rel + diabetes.rel +
hpcirrh.rel, data=dat)
res
```

Mixed-Effects Model (k = 8; tau^2 estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0621)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):              100.00%
```

```
Test for Residual Heterogeneity:
QE(df = 4) = 1.5899, p-val = 0.8106
```

```
Test of Moderators (coefficients 2:4):
QM(df = 3) = 2.9721, p-val = 0.3960
```

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.5695	0.1408	4.0461	<.0001	0.2936	0.8454	***
hivaids.rel	-0.0067	0.5971	-0.0112	0.9911	-1.1771	1.1637	
diabetes.rel	-1.6213	2.4595	-0.6592	0.5098	-6.4417	3.1992	
hepcirrh.rel	-0.7552	1.1584	-0.6520	0.5144	-3.0257	1.5152	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = HIV + Diabetes + Other

fit mixed-effects model with hivaids, diabetes and other as moderators

```
res <- rma(yi, vi, mods = ~ hiv aids.rel + diabetes.rel + other.rel,
data=dat)
res
```

Mixed-Effects Model (k = 10; tau^2 estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0233)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):     1.00
R^2 (amount of heterogeneity accounted for):              0.00%
```

Test for Residual Heterogeneity:

QE(df = 6) = 2.0727, p-val = 0.9129

Test of Moderators (coefficients 2:4):

QM(df = 3) = 4.3470, p-val = 0.2263

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4898	0.1150	4.2572	<.0001	0.2643	0.7153	***
hiv aids.rel	1.7068	1.7425	0.9795	0.3273	-1.7083	5.1220	
diabetes.rel	-0.2967	1.8400	-0.1612	0.8719	-3.9030	3.3097	
other.rel	-1.2154	0.8484	-1.4326	0.1520	-2.8781	0.4474	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Diabetes + Cancers + Hepcirrh

fit mixed-effects model with diabetes, cancers and hepcirrh as moderators

```
res <- rma(yi, vi, mods = ~ diabetes.rel + cancers.rel +
hepcirrh.rel, data=dat)
res
```

Mixed-Effects Model (k = 5; tau^2 estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.2759)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):     1.00
R^2 (amount of heterogeneity accounted for):              0.00%
```

Test for Residual Heterogeneity:

QE(df = 1) = 0.1289, p-val = 0.7196

Test of Moderators (coefficients 2:4):

QM(df = 3) = 1.7930, p-val = 0.6165

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.5874	0.3210	1.8296	0.0673	-0.0419	
1.2166 .						
diabetes.rel	0.1079	17.3249	0.0062	0.9950	-33.8482	34.0640
cancers.rel	-2.5982	31.2030	-0.0833	0.9336	-63.7549	58.5586
hepcirrh.rel	-1.0007	3.7230	-0.2688	0.7881	-8.2977	6.2962

```
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Diabetes + Cancers + Other

```
### fit mixed-effects model with diabetes, cancers and other as
moderators
res <- rma(yi, vi, mods = ~ diabetes.rel + cancers.rel + other.rel,
data=dat)
res
```

Mixed-Effects Model (k = 9; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0258)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

```
Test for Residual Heterogeneity:
QE(df = 5) = 3.3517, p-val = 0.6459
```

```
Test of Moderators (coefficients 2:4):
QM(df = 3) = 3.1469, p-val = 0.3695
```

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.4366	0.1284	3.4005	0.0007	0.1850	0.6883

diabetes.rel	-2.1486	1.8792	-1.1434	0.2529	-5.8318	1.5345
cancers.rel	5.2545	4.7326	1.1103	0.2669	-4.0212	14.5302
other.rel	-0.3676	0.9899	-0.3714	0.7104	-2.3078	1.5726

```
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

III. Risk Factors

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Nohome

```
### fit mixed-effects model with alcohol and nohome as moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + nohome.rel, data=dat)
res
```

Mixed-Effects Model (k = 9; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0230)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             100.00%
```

```
Test for Residual Heterogeneity:
QE(df = 6) = 3.6031, p-val = 0.7302
```

```
Test of Moderators (coefficients 2:3):
QM(df = 2) = 2.6475, p-val = 0.2661
```

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.2804	0.1024	2.7391	0.0062	0.0798	0.4810	**
alcohol.rel	0.1368	0.5956	0.2297	0.8183	-1.0305	1.3041	
nohome.rel	2.7043	3.7928	0.7130	0.4758	-4.7294	10.1381	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Smoker

```
### fit mixed-effects model with alcohol and smoker as moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + smoker.rel, data=dat)
res
```

Mixed-Effects Model (k = 10; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0303)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:

QE(df = 7) = 4.8322, p-val = 0.6804

Test of Moderators (coefficients 2:3):

QM(df = 2) = 0.5160, p-val = 0.7726

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3811	0.1821	2.0924	0.0364	0.0241	0.7381	*
alcohol.rel	0.4621	0.7530	0.6136	0.5395	-1.0138	1.9379	
smoker.rel	-0.2353	0.7487	-0.3142	0.7534	-1.7027	1.2322	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Drugs

```
### fit mixed-effects model with alcohol and drugs as moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + drugs.rel, data=dat)
res
```

Mixed-Effects Model (k = 15; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0.0004 (SE = 0.0148)
tau (square root of estimated tau² value): 0.0199
I² (residual heterogeneity / unaccounted variability): 0.84%
H² (unaccounted variability / sampling variability): 1.01
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:

QE(df = 12) = 8.1843, p-val = 0.7706

Test of Moderators (coefficients 2:3):
 QM(df = 2) = 1.1418, p-val = 0.5650

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3408	0.0779	4.3735	<.0001	0.1881	0.4935	***
alcohol.rel	0.5724	0.6615	0.8652	0.3869	-0.7242	1.8690	
drugs.rel	-0.1027	1.0415	-0.0986	0.9215	-2.1440	1.9387	

Signif. Codes: 0 '****' 0.001 '***' 0.01 '**' 0.05 '.' 0.1 ' ' 1

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Migrant

```
### fit mixed-effects model with alcohol and migrant as moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + migrant.rel, data=dat)
res
```

Mixed-Effects Model (k = 5; tau^2 estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE = 0.0434)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):              0.00%
```

Test for Residual Heterogeneity:
 QE(df = 2) = 0.0146, p-val = 0.9927

Test of Moderators (coefficients 2:3):
 QM(df = 2) = 1.7303, p-val = 0.4210

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.0070	0.3224	0.0216	0.9828	-0.6250	0.6389
alcohol.rel	4.2910	3.5771	1.1996	0.2303	-2.7200	11.3021
migrant.rel	0.4171	0.6766	0.6165	0.5376	-0.9089	1.7431

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Formerth

```
### fit mixed-effects model with alcohol and formertb as moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + formertb.rel, data=dat)
res
```

Mixed-Effects Model (k = 12; tau^2 estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE = 0.0169)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):              100.00%
```

Test for Residual Heterogeneity:
QE(df = 9) = 4.9155, p-val = 0.8416

Test of Moderators (coefficients 2:3):
QM(df = 2) = 3.3089, p-val = 0.1912

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4161	0.0791	5.2584	<.0001	0.2610	0.5712	***
alcohol.rel	0.9276	0.5380	1.7241	0.0847	-0.1269	1.9821	.
formertb.rel	-0.9547	0.5488	-1.7396	0.0819	-2.0303	0.1209	.

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Prison

```
### fit mixed-effects model with alcohol and prison as moderators  
res <- rma(yi, vi, mods = ~ alcohol.rel + prison.rel, data=dat)  
res
```

Mixed-Effects Model (k = 8; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0281)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 5) = 1.8860, p-val = 0.8647

Test of Moderators (coefficients 2:3):
QM(df = 2) = 2.4308, p-val = 0.2966

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3048	0.1569	1.9430	0.0520	-0.0027	0.6122	.
alcohol.rel	1.0728	0.7010	1.5304	0.1259	-0.3011	2.4467	.
prison.rel	-1.5944	2.3392	-0.6816	0.4955	-6.1792	2.9903	.

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Otherrf

```
### fit mixed-effects model with alcohol and otherrf as moderators  
res <- rma(yi, vi, mods = ~ alcohol.rel + otherrf.rel, data=dat)  
res
```

Mixed-Effects Model (k = 10; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0445)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00

R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 7) = 4.3679, p-val = 0.7366

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.0956, p-val = 0.9533

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3590	0.1418	2.5314	0.0114	0.0810	0.6370	*
alcohol.rel	0.2902	1.9349	0.1500	0.8808	-3.5022	4.0826	
otherrf.rel	-0.1437	1.5815	-0.0909	0.9276	-3.2434	2.9559	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + MDR

```
### fit mixed-effects model with alcohol and mdr as moderators  
res <- rma(yi, vi, mods = ~ alcohol.rel + mdr.rel, data=dat)  
res
```

Mixed-Effects Model (k = 10; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0250)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 7) = 3.1920, p-val = 0.8667

Test of Moderators (coefficients 2:3):
QM(df = 2) = 3.4288, p-val = 0.1801

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.2230	0.1269	1.7574	0.0789	-0.0257	0.4716	.
alcohol.rel	1.2575	0.6924	1.8161	0.0694	-0.0996	2.6147	.
mdr.rel	-0.5485	0.4127	-1.3291	0.1838	-1.3573	0.2603	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + MonoDR

```
### fit mixed-effects model with alcohol and monodr as moderators  
res <- rma(yi, vi, mods = ~ alcohol.rel + monodr.rel, data=dat)  
res
```

Mixed-Effects Model (k = 9; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0377)
tau (square root of estimated tau² value): 0

I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 6) = 4.8686, p-val = 0.5608

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.9782, p-val = 0.6132

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3591	0.1473	2.4378	0.0148	0.0704	0.6478	*
alcohol.rel	0.4266	0.6545	0.6518	0.5145	-0.8561	1.7094	
monodr.rel	-0.3636	0.4391	-0.8281	0.4076	-1.2241	0.4969	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Nohome + Smoker

```
### fit mixed-effects model with nohome and smoker as moderators
res <- rma(yi, vi, mods = ~ nohome.rel + smoker.rel, data=dat)
res
```

Mixed-Effects Model (k = 5; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0468)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 2) = 0.8326, p-val = 0.6595

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.6627, p-val = 0.7180

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3817	0.1889	2.0204	0.0433	0.0114	0.7520	*
nohome.rel	3.2228	6.5592	0.4913	0.6232	-9.6329	16.0785	
smoker.rel	-0.1624	1.0114	-0.1606	0.8724	-2.1446	1.8198	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Nohome + Drugs

```
### fit mixed-effects model with nohome and drugs as moderators
res <- rma(yi, vi, mods = ~ nohome.rel + drugs.rel, data=dat)
res
```

Mixed-Effects Model (k = 8; tau² estimator: REML)

```

tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0260)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             100.00%

```

```

Test for Residual Heterogeneity:
QE(df = 5) = 2.4623, p-val = 0.7822

```

```

Test of Moderators (coefficients 2:3):
QM(df = 2) = 2.9322, p-val = 0.2308

```

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.2677	0.1079	2.4816	0.0131	0.0563	0.4791	*
nohome.rel	0.7551	10.3238	0.0731	0.9417	-19.4791	20.9893	
drugs.rel	1.0242	3.6764	0.2786	0.7806	-6.1815	8.2299	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Nohome + Migrant

```

### fit mixed-effects model with nohome and migrant as moderators
res <- rma(yi, vi, mods = ~ nohome.rel + migrant.rel, data=dat)
res

```

Mixed-Effects Model (k = 5; tau^2 estimator: REML)

```

tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0398)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%

```

```

Test for Residual Heterogeneity:
QE(df = 2) = 0.8199, p-val = 0.6637

```

```

Test of Moderators (coefficients 2:3):
QM(df = 2) = 1.1365, p-val = 0.5665

```

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.1644	0.2127	0.7729	0.4396	-0.2525	0.5814
nohome.rel	3.7001	3.5369	1.0462	0.2955	-3.2320	10.6322
migrant.rel	0.1441	0.4962	0.2903	0.7716	-0.8285	1.1167

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Nohome + Formertb

```

### fit mixed-effects model with nohome and formertb as moderators
res <- rma(yi, vi, mods = ~ nohome.rel + formertb.rel, data=dat)
res

```

Mixed-Effects Model (k = 7; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0273)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 100.00%

Test for Residual Heterogeneity:
QE(df = 4) = 1.6209, p-val = 0.8050

Test of Moderators (coefficients 2:3):
QM(df = 2) = 2.4805, p-val = 0.2893

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.2942	0.1213	2.4244	0.0153	0.0563	0.5320	*
nohome.rel	3.9599	2.6315	1.5048	0.1324	-1.1977	9.1176	
formertb.rel	-0.1756	0.4674	-0.3757	0.7071	-1.0917	0.7405	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Nohome + Prison

```
### fit mixed-effects model with nohome and prison as moderators  
res <- rma(yi, vi, mods = ~ nohome.rel + prison.rel, data=dat)  
res
```

Mixed-Effects Model (k = 6; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0370)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 3) = 2.3800, p-val = 0.4974

Test of Moderators (coefficients 2:3):
QM(df = 2) = 1.6910, p-val = 0.4293

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3173	0.2429	1.3065	0.1914	-0.1587	0.7933
nohome.rel	3.1351	2.4142	1.2986	0.1941	-1.5966	7.8667
prison.rel	-0.6079	6.4263	-0.0946	0.9246	-13.2033	11.9874

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Nohome + Otherrf

```
### fit mixed-effects model with nohome and otherrf as moderators  
res <- rma(yi, vi, mods = ~ nohome.rel + otherrf.rel, data=dat)
```

res

Mixed-Effects Model (k = 5; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.1035)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 2) = 0.1347, p-val = 0.9349

Test of Moderators (coefficients 2:3):
QM(df = 2) = 1.4798, p-val = 0.4772

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.6433	0.2740	2.3478	0.0189	0.1063	1.1803	*
nohome.rel	-25.7846	21.6427	-1.1914	0.2335	-68.2034	16.6342	
otherrf.rel	2.5262	2.0767	1.2165	0.2238	-1.5440	6.5964	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Nohome + MDR

```
### fit mixed-effects model with nohome and mdr as moderators  
res <- rma(yi, vi, mods = ~ nohome.rel + mdr.rel, data=dat)  
res
```

Mixed-Effects Model (k = 7; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0335)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 4) = 2.5884, p-val = 0.6289

Test of Moderators (coefficients 2:3):
QM(df = 2) = 1.7878, p-val = 0.4091

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.2713	0.1440	1.8838	0.0596	-0.0110	0.5536	.
nohome.rel	3.5550	2.7771	1.2801	0.2005	-1.8880	8.9981	
mdr.rel	-0.0345	0.2457	-0.1405	0.8883	-0.5160	0.4470	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Nohome + MonoDR

```
### fit mixed-effects model with nohome and monodr as moderators
res <- rma(yi, vi, mods = ~ nohome.rel + monodr.rel, data=dat)
res
```

Mixed-Effects Model (k = 5; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):    0.0077 (SE = 0.0663)
tau (square root of estimated tau^2 value):           0.0878
I^2 (residual heterogeneity / unaccounted variability): 11.14%
H^2 (unaccounted variability / sampling variability):  1.13
R^2 (amount of heterogeneity accounted for):           52.04%
```

Test for Residual Heterogeneity:

QE(df = 2) = 2.7776, p-val = 0.2494

Test of Moderators (coefficients 2:3):

QM(df = 2) = 1.0659, p-val = 0.5869

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.2418	0.3854	0.6274	0.5304	-0.5135	0.9971
nohome.rel	3.3347	3.4098	0.9780	0.3281	-3.3485	10.0178
monodr.rel	0.7544	4.5071	0.1674	0.8671	-8.0794	9.5882

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Smoker + Drugs

```
### fit mixed-effects model with smoker and drugs as moderators
res <- rma(yi, vi, mods = ~ smoker.rel + drugs.rel, data=dat)
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):    0 (SE = 0.0415)
tau (square root of estimated tau^2 value):           0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):  1.00
R^2 (amount of heterogeneity accounted for):           0.00%
```

Test for Residual Heterogeneity:

QE(df = 4) = 1.4650, p-val = 0.8328

Test of Moderators (coefficients 2:3):

QM(df = 2) = 2.8109, p-val = 0.2453

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.5403	0.2391	2.2601	0.0238	0.0717	1.0088
smoker.rel	-2.3725	1.8082	-1.3121	0.1895	-5.9164	1.1715
drugs.rel	5.4413	3.4648	1.5704	0.1163	-1.3496	12.2322

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Smoker + Migrant

```
### fit mixed-effects model with smoker and migrant as moderators
res <- rma(yi, vi, mods = ~ smoker.rel + migrant.rel, data=dat)
res
```

Warning messages:

- 1: Studies with NAs omitted from model fitting.
- 2: Redundant predictors dropped from the model.

Random-Effects Model (k = 1; tau² estimator: REML)

tau² (estimated amount of total heterogeneity): 0
tau (square root of estimated tau² value): 0
I² (total heterogeneity / total variability): 0.00%
H² (total variability / sampling variability): 1.00

Test for Heterogeneity:

Q(df = 0) = 0.0000, p-val = 1.0000

Model Results:

estimate	se	zval	pval	ci.lb	ci.ub
0.3079	0.2260	1.3626	0.1730	-0.1350	0.7509

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Smoker + Former tb

```
### fit mixed-effects model with smoker and formertb as moderators
res <- rma(yi, vi, mods = ~ smoker.rel + formertb.rel, data=dat)
res
```

Mixed-Effects Model (k = 8; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0.0005 (SE = 0.0483)
tau (square root of estimated tau² value): 0.0220
I² (residual heterogeneity / unaccounted variability): 0.53%
H² (unaccounted variability / sampling variability): 1.01
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:

QE(df = 5) = 4.3122, p-val = 0.5054

Test of Moderators (coefficients 2:3):

QM(df = 2) = 0.5133, p-val = 0.7736

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3335	0.2450	1.3612	0.1735	-0.1467	0.8138
smoker.rel	0.4969	0.7602	0.6536	0.5134	-0.9932	1.9869
formertb.rel	-0.4311	0.6309	-0.6833	0.4944	-1.6676	0.8054

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Smoker + Prison

```
### fit mixed-effects model with smoker and prison as moderators
res <- rma(yi, vi, mods = ~ smoker.rel + prison.rel, data=dat)
res
```

Mixed-Effects Model (k = 5; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0461)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

Test for Residual Heterogeneity:

QE(df = 2) = 0.2593, p-val = 0.8784

Test of Moderators (coefficients 2:3):

QM(df = 2) = 1.5846, p-val = 0.4528

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.2877	0.2339	1.2301	0.2186	-0.1707	0.7461
smoker.rel	0.7083	0.6094	1.1623	0.2451	-0.4861	1.9027
prison.rel	-0.9268	2.3680	-0.3914	0.6955	-5.5681	3.7144

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Smoker + Otherrf

```
### fit mixed-effects model with smoker and otherrf as moderators
res <- rma(yi, vi, mods = ~ smoker.rel + otherrf.rel, data=dat)
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0895)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

Test for Residual Heterogeneity:

QE(df = 4) = 1.3357, p-val = 0.8553

Test of Moderators (coefficients 2:3):

QM(df = 2) = 1.7852, p-val = 0.4096

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3606	0.2162	1.6684	0.0952	-0.0630	0.7843
smoker.rel	-1.0586	1.0055	-1.0528	0.2924	-3.0293	0.9121
otherrf.rel	1.0800	0.8197	1.3176	0.1876	-0.5265	2.6865

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Smoker + MDR

```
### fit mixed-effects model with smoker and mdr as moderators
res <- rma(yi, vi, mods = ~ smoker.rel + mdr.rel, data=dat)
res
```

Mixed-Effects Model (k = 6; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0395)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

Test for Residual Heterogeneity:

QE(df = 3) = 2.9633, p-val = 0.3973

Test of Moderators (coefficients 2:3):

QM(df = 2) = 1.0511, p-val = 0.5912

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.2370	0.2054	1.1539	0.2486	-0.1655	0.6395
smoker.rel	0.5909	0.6003	0.9844	0.3249	-0.5856	1.7674
mdr.rel	-0.1370	0.3131	-0.4375	0.6617	-0.7506	0.4766

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Smoker + MonoDR

```
### fit mixed-effects model with smoker and monodr as moderators
res <- rma(yi, vi, mods = ~ smoker.rel + monodr.rel, data=dat)
res
```

Mixed-Effects Model (k = 5; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0805)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

Test for Residual Heterogeneity:

QE(df = 2) = 0.6006, p-val = 0.7406

Test of Moderators (coefficients 2:3):

QM(df = 2) = 2.2229, p-val = 0.3291

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.8527	0.3940	2.1642	0.0304	0.0805	1.6250
smoker.rel	0.2366	0.5392	0.4389	0.6607	-0.8202	1.2934
monodr.rel	-9.5566	6.4822	-1.4743	0.1404	-22.2614	3.1483

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Drugs + Migrant

```
### fit mixed-effects model with drugs and migrant as moderators
res <- rma(yi, vi, mods = ~ drugs.rel + migrant.rel, data=dat)
res
```

Mixed-Effects Model (k = 6; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0378)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):              0.00%
```

Test for Residual Heterogeneity:

QE(df = 3) = 1.0283, p-val = 0.7944

Test of Moderators (coefficients 2:3):

QM(df = 2) = 1.1547, p-val = 0.5614

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3150	0.1459	2.1584	0.0309	0.0290	0.6011	*
drugs.rel	1.0504	1.1031	0.9522	0.3410	-1.1116	3.2124	
migrant.rel	-0.2207	0.4144	-0.5327	0.5943	-1.0329	0.5915	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Drugs + Formertb

```
### fit mixed-effects model with drugs and formertb as moderators
res <- rma(yi, vi, mods = ~ drugs.rel + formertb.rel, data=dat)
res
```

Mixed-Effects Model (k = 10; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0179)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):              100.00%
```

Test for Residual Heterogeneity:

QE(df = 7) = 3.0065, p-val = 0.8844

Test of Moderators (coefficients 2:3):

QM(df = 2) = 4.3475, p-val = 0.1138

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4270	0.0903	4.7308	<.0001	0.2501	0.6039	

drugs.rel	1.5284	0.9970	1.5330	0.1253	-0.4257	3.4825	
formertb.rel	-1.2788	0.6284	-2.0351	0.0418	-2.5103	-0.0472	*

```

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

```

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Drugs + Prison

```

### fit mixed-effects model with drugs and prison as moderators
res <- rma(yi, vi, mods = ~ drugs.rel + prison.rel, data=dat)
res

```

Mixed-Effects Model (k = 8; tau² estimator: REML)

```

tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0271)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%

```

Test for Residual Heterogeneity:
QE(df = 5) = 1.8589, p-val = 0.8683

Test of Moderators (coefficients 2:3):
QM(df = 2) = 2.0722, p-val = 0.3548

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3179	0.1472	2.1593	0.0308	0.0293	0.6064	*
drugs.rel	1.1097	0.7737	1.4344	0.1515	-0.4066	2.6261	
prison.rel	0.0064	2.2062	0.0029	0.9977	-4.3176	4.3304	

```

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

```

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Drugs + Otherrf

```

### fit mixed-effects model with drugs and otherrf as moderators
res <- rma(yi, vi, mods = ~ drugs.rel + otherrf.rel, data=dat)
res

```

Mixed-Effects Model (k = 7; tau² estimator: REML)

```

tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0529)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%

```

Test for Residual Heterogeneity:
QE(df = 4) = 1.9780, p-val = 0.7398

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.5974, p-val = 0.7418

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4574	0.1980	2.3105	0.0209	0.0694	0.8454	*
drugs.rel	-1.1669	2.6172	-0.4459	0.6557	-6.2965	3.9626	

```
otherrf.rel    -0.5764    0.9574   -0.6020    0.5472   -2.4529    1.3001
```

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Drugs + MDR

```
### fit mixed-effects model with drugs and mdr as moderators
```

```
res <- rma(yi, vi, mods = ~ drugs.rel + mdr.rel, data=dat)
```

```
res
```

Mixed-Effects Model (k = 9; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):    0.0000 (SE = 0.0287)
```

```
tau (square root of estimated tau^2 value):            0.0006
```

```
I^2 (residual heterogeneity / unaccounted variability): 0.00%
```

```
H^2 (unaccounted variability / sampling variability):   1.00
```

```
R^2 (amount of heterogeneity accounted for):            48.20%
```

Test for Residual Heterogeneity:

```
QE(df = 6) = 6.4727, p-val = 0.3724
```

Test of Moderators (coefficients 2:3):

```
QM(df = 2) = 2.0147, p-val = 0.3652
```

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3783	0.1419	2.6653	0.0077	0.1001	0.6564	**
drugs.rel	0.9963	0.9682	1.0290	0.3035	-0.9013	2.8939	
mdr.rel	-1.6438	2.0503	-0.8017	0.4227	-5.6624	2.3747	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Drugs + MonoDR

```
### fit mixed-effects model with drugs and monodr as moderators
```

```
res <- rma(yi, vi, mods = ~ drugs.rel + monodr.rel, data=dat)
```

```
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):    0.0148 (SE = 0.0503)
```

```
tau (square root of estimated tau^2 value):            0.1217
```

```
I^2 (residual heterogeneity / unaccounted variability): 19.71%
```

```
H^2 (unaccounted variability / sampling variability):   1.25
```

```
R^2 (amount of heterogeneity accounted for):            0.00%
```

Test for Residual Heterogeneity:

```
QE(df = 4) = 4.0738, p-val = 0.3961
```

Test of Moderators (coefficients 2:3):

```
QM(df = 2) = 0.6661, p-val = 0.7167
```

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
--	----------	----	------	------	-------	-------

intrcpt	0.4287	0.1497	2.8630	0.0042	0.1352	0.7222	**
drugs.rel	-0.0398	0.3251	-0.1224	0.9026	-0.6771	0.5975	
monodr.rel	-0.3683	0.4748	-0.7756	0.4380	-1.2989	0.5624	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Migrant + Formertb

```
### fit mixed-effects model with migrant and formertb as moderators
res <- rma(yi, vi, mods = ~ migrant.rel + formertb.rel, data=dat)
res
```

Mixed-Effects Model (k = 7; tau^2 estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0042)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):     1.00
R^2 (amount of heterogeneity accounted for):             100.00%
```

Test for Residual Heterogeneity:
QE(df = 4) = 2.0198, p-val = 0.7321

Test of Moderators (coefficients 2:3):
QM(df = 2) = 5.1775, p-val = 0.0751

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.7263	0.2146	3.3845	0.0007	0.3057	1.1469

migrant.rel	-0.5990	0.2679	-2.2360	0.0254	-1.1241	-0.0740
*						
formertb.rel	-0.1826	1.3756	-0.1327	0.8944	-2.8786	2.5135

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Migrant + Prison

```
### fit mixed-effects model with migrant and prison as moderators
res <- rma(yi, vi, mods = ~ migrant.rel + prison.rel, data=dat)
res
```

Error in rma(yi, vi, mods = ~migrant.rel + prison.rel, data = dat) :
Number of parameters to be estimated is larger than the number of observations.

In addition: Warning message:

Studies with NAs omitted from model fitting.

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Migrant + Otherrf

```
### fit mixed-effects model with migrant and otherrf as moderators
res <- rma(yi, vi, mods = ~ migrant.rel + otherrf.rel, data=dat)
res
```

Mixed-Effects Model (k = 4; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.1200)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 1) = 0.2724, p-val = 0.6018

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.3525, p-val = 0.8384

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.4024	0.3014	1.3349	0.1819	-0.1884	0.9932
migrant.rel	0.4041	0.7004	0.5770	0.5640	-0.9687	1.7769
otherrf.rel	-0.6514	6.5871	-0.0989	0.9212	-13.5619	12.2592

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Migrant + MDR

```
### fit mixed-effects model with migrant and mdr as moderators  
res <- rma(yi, vi, mods = ~ migrant.rel + mdr.rel, data=dat)  
res
```

Mixed-Effects Model (k = 5; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0441)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 2) = 1.4813, p-val = 0.4768

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.3331, p-val = 0.8466

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3315	0.1558	2.1280	0.0333	0.0262	0.6368 *
migrant.rel	0.0090	0.2413	0.0374	0.9702	-0.4639	0.4820
mdr.rel	-1.8894	3.3130	-0.5703	0.5685	-8.3827	4.6039

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Migrant + MonoDR

```
### fit mixed-effects model with migrant and monodr as moderators  
res <- rma(yi, vi, mods = ~ migrant.rel + monodr.rel, data=dat)
```

res

```
Error in rma(yi, vi, mods = ~migrant.rel + monodr.rel, data = dat) :  
  Number of parameters to be estimated is larger than the number of  
  observations.  
In addition: Warning message:  
Studies with NAs omitted from model fitting.
```

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Formertb + Prison

```
### fit mixed-effects model with formertb and prison as moderators  
res <- rma(yi, vi, mods = ~ formertb.rel + prison.rel, data=dat)  
res
```

Mixed-Effects Model (k = 5; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0.0174 (SE =  
0.0597)  
tau (square root of estimated tau^2 value):             0.1320  
I^2 (residual heterogeneity / unaccounted variability): 28.56%  
H^2 (unaccounted variability / sampling variability):    1.40  
R^2 (amount of heterogeneity accounted for):            21.86%
```

Test for Residual Heterogeneity:
QE(df = 2) = 2.5006, p-val = 0.2864

Test of Moderators (coefficients 2:3):
QM(df = 2) = 1.1165, p-val = 0.5722

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.5249	0.2040	2.5726	0.0101	0.1250	0.9248	*
formertb.rel	-1.0300	0.9797	-1.0513	0.2931	-2.9503	0.8902	
prison.rel	0.3450	2.2508	0.1533	0.8782	-4.0664	4.7564	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Formertb + Otherrf

```
### fit mixed-effects model with formertb and otherrf as moderators  
res <- rma(yi, vi, mods = ~ formertb.rel + otherrf.rel, data=dat)  
res
```

Mixed-Effects Model (k = 9; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =  
0.0351)  
tau (square root of estimated tau^2 value):             0  
I^2 (residual heterogeneity / unaccounted variability): 0.00%  
H^2 (unaccounted variability / sampling variability):    1.00  
R^2 (amount of heterogeneity accounted for):            100.00%
```

Test for Residual Heterogeneity:
QE(df = 6) = 4.0331, p-val = 0.6722

Test of Moderators (coefficients 2:3):
QM(df = 2) = 1.0991, p-val = 0.5772

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.1812	0.1845	0.9825	0.3259	-0.1803	0.5428
formertb.rel	0.7214	0.7021	1.0276	0.3042	-0.6546	2.0975
otherrf.rel	-0.2859	0.5443	-0.5253	0.5994	-1.3528	0.7809

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Formertb + MDR

```
### fit mixed-effects model with formertb and mdr as moderators
res <- rma(yi, vi, mods = ~ formertb.rel + mdr.rel, data=dat)
res
```

Mixed-Effects Model (k = 8; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0.0085 (SE = 0.0227)
tau (square root of estimated tau^2 value): 0.0922
I^2 (residual heterogeneity / unaccounted variability): 21.89%
H^2 (unaccounted variability / sampling variability): 1.28
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 5) = 5.3565, p-val = 0.3739

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.5371, p-val = 0.7645

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4186	0.1271	3.2938	0.0010	0.1695	0.6678	***
formertb.rel	-0.6435	1.2470	-0.5160	0.6058	-3.0876	1.8006	
mdr.rel	0.4811	0.7277	0.6611	0.5085	-0.9452	1.9075	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Formertb + MonoDR

```
### fit mixed-effects model with formertb and monodr as moderators
res <- rma(yi, vi, mods = ~ formertb.rel + monodr.rel, data=dat)
res
```

Mixed-Effects Model (k = 6; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0434)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 100.00%

Test for Residual Heterogeneity:
QE(df = 3) = 1.8085, p-val = 0.6131

Test of Moderators (coefficients 2:3):

QM(df = 2) = 2.6214, p-val = 0.2696

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	1.0078	0.4117	2.4479	0.0144	0.2009	1.8147	*
formertb.rel	-4.4467	3.0610	-1.4527	0.1463	-10.4461	1.5527	
monodr.rel	2.0376	1.6698	1.2203	0.2224	-1.2351	5.3104	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Prison + Otherrf

```
### fit mixed-effects model with prison and otherrf as moderators
res <- rma(yi, vi, mods = ~ prison.rel + otherrf.rel, data=dat)
res
```

Mixed-Effects Model (k = 5; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0985)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:

QE(df = 2) = 1.0815, p-val = 0.5823

Test of Moderators (coefficients 2:3):

QM(df = 2) = 0.7237, p-val = 0.6964

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.4005	0.2206	1.8156	0.0694	-0.0319	0.8329	.
prison.rel	0.3849	2.1024	0.1831	0.8547	-3.7358	4.5056	
otherrf.rel	-0.3867	0.4854	-0.7967	0.4256	-1.3381	0.5647	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Prison + MDR

```
### fit mixed-effects model with prison and mdr as moderators
res <- rma(yi, vi, mods = ~ prison.rel + mdr.rel, data=dat)
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0.0146 (SE = 0.0505)
tau (square root of estimated tau² value): 0.1207
I² (residual heterogeneity / unaccounted variability): 19.68%
H² (unaccounted variability / sampling variability): 1.24
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:

QE(df = 4) = 4.2058, p-val = 0.3789

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.0352, p-val = 0.9825

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.4975	0.3932	1.2653	0.2057	-0.2731	1.2682
prison.rel	-2.6283	14.5350	-0.1808	0.8565	-31.1164	25.8599
mdr.rel	0.9483	7.1018	0.1335	0.8938	-12.9710	14.8677

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Prison + MonoDR

```
### fit mixed-effects model with prison and monodr as moderators
res <- rma(yi, vi, mods = ~ prison.rel + monodr.rel, data=dat)
res
```

Mixed-Effects Model (k = 4; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0630)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 100.00%

Test for Residual Heterogeneity:
QE(df = 1) = 0.4868, p-val = 0.4853

Test of Moderators (coefficients 2:3):
QM(df = 2) = 3.3418, p-val = 0.1881

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	1.5192	0.6560	2.3157	0.0206	0.2334	2.8051 *
prison.rel	-56.6191	31.0699	-1.8223	0.0684	-117.5150	4.2768 .
monodr.rel	6.3002	5.7613	1.0935	0.2742	-4.9917	17.5921

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Otherrf + MDR

```
### fit mixed-effects model with otherrf and mdr as moderators
res <- rma(yi, vi, mods = ~ otherrf.rel + mdr.rel, data=dat)
res
```

Mixed-Effects Model (k = 7; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0587)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 4) = 2.9869, p-val = 0.5600

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.5602, p-val = 0.7557

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3277	0.1965	1.6672	0.0955	-0.0575	0.7129
otherrf.rel	-0.0936	1.4360	-0.0652	0.9481	-2.9080	2.7209
mdr.rel	0.2487	0.9488	0.2621	0.7932	-1.6110	2.1084

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Otherrf + MonoDR

```
### fit mixed-effects model with otherrf and monodr as moderators  
res <- rma(yi, vi, mods = ~ otherrf.rel + monodr.rel, data=dat)  
res
```

Mixed-Effects Model (k = 5; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0966)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 2) = 1.1589, p-val = 0.5602

Test of Moderators (coefficients 2:3):
QM(df = 2) = 0.9384, p-val = 0.6255

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3832	0.3573	1.0726	0.2835	-0.3170	1.0834
otherrf.rel	-1.1642	1.2907	-0.9020	0.3670	-3.6939	1.3654
monodr.rel	2.5405	4.5338	0.5603	0.5752	-6.3456	11.4265

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Drugs + Formertb

```
### fit mixed-effects model with alcohol, drugs and formertb as  
moderators  
res <- rma(yi, vi, mods = ~ alcohol.rel + drugs.rel + formertb.rel,  
data=dat)  
res
```

Mixed-Effects Model (k = 10; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0192)
tau (square root of estimated tau^2 value): 0

I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 100.00%

Test for Residual Heterogeneity:
QE(df = 6) = 2.6864, p-val = 0.8471

Test of Moderators (coefficients 2:4):
QM(df = 3) = 4.6676, p-val = 0.1978

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.4196	0.0912	4.6000	<.0001	0.2408	0.5983

alcohol.rel	0.8087	1.4294	0.5658	0.5715	-1.9928	3.6102
drugs.rel	0.5140	2.0514	0.2505	0.8022	-3.5068	4.5347
formertb.rel	-1.2493	0.6305	-1.9814	0.0475	-2.4851	-0.0135
*						

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Drugs + Prison

```
### fit mixed-effects model with alcohol, drugs and prison as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + drugs.rel + prison.rel,
data=dat)
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0352)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 3) = 0.8233, p-val = 0.8439

Test of Moderators (coefficients 2:4):
QM(df = 3) = 2.9145, p-val = 0.4050

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.2439	0.1711	1.4259	0.1539	-0.0914	0.5792
alcohol.rel	0.8229	0.9871	0.8336	0.4045	-1.1117	2.7574
drugs.rel	0.6654	1.4209	0.4683	0.6396	-2.1196	3.4503
prison.rel	-0.7451	2.8294	-0.2633	0.7923	-6.2905	4.8004

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Drugs + Otherrf

```
### fit mixed-effects model with alcohol, drugs and otherrf as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + drugs.rel + otherrf.rel,
data=dat)
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0684)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

Test for Residual Heterogeneity:
QE(df = 3) = 1.8034, p-val = 0.6142

Test of Moderators (coefficients 2:4):
QM(df = 3) = 0.7720, p-val = 0.8562

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3410	0.3417	0.9981	0.3182	-0.3286	1.0107
alcohol.rel	2.0860	4.9921	0.4179	0.6760	-7.6984	11.8704
drugs.rel	-1.5305	2.7580	-0.5549	0.5789	-6.9362	3.8751
otherrf.rel	-1.4892	2.3852	-0.6244	0.5324	-6.1640	3.1856

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Drugs + MDR

```
### fit mixed-effects model with alcohol, drugs and mdr as moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + drugs.rel + mdr.rel,
data=dat)
res
```

Mixed-Effects Model (k = 8; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0339)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

Test for Residual Heterogeneity:
QE(df = 4) = 1.3141, p-val = 0.8590

Test of Moderators (coefficients 2:4):
QM(df = 3) = 4.4169, p-val = 0.2198

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.2634	0.1530	1.7215	0.0852	-0.0365	0.5633
alcohol.rel	1.3225	0.8686	1.5226	0.1279	-0.3799	3.0248
drugs.rel	0.0288	1.2141	0.0237	0.9811	-2.3509	2.4084

```
mdr.rel      -2.5047  2.1969  -1.1401  0.2542  -6.8105  1.8011
```

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Drugs + MonoDR

```
### fit mixed-effects model with alcohol, drugs and monodr as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + drugs.rel + monodr.rel,
data=dat)
res
```

Mixed-Effects Model (k = 6; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):    0 (SE =
0.1010)
tau (square root of estimated tau^2 value):            0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):   1.00
R^2 (amount of heterogeneity accounted for):           100.00%
```

Test for Residual Heterogeneity:
QE(df = 2) = 1.4191, p-val = 0.4919

Test of Moderators (coefficients 2:4):
QM(df = 3) = 3.0141, p-val = 0.3895

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.2832	0.1627	1.7406	0.0818	-0.0357	0.6021
alcohol.rel	0.7718	3.7395	0.2064	0.8365	-6.5576	8.1011
drugs.rel	0.5752	4.7739	0.1205	0.9041	-8.7815	9.9319
monodr.rel	-0.5412	0.4977	-1.0874	0.2769	-1.5168	0.4343

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Smoker + Drugs

```
### fit mixed-effects model with alcohol, drugs and smoker as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + smoker.rel + drugs.rel,
data=dat)
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):    0 (SE =
0.0449)
tau (square root of estimated tau^2 value):            0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):   1.00
R^2 (amount of heterogeneity accounted for):           0.00%
```

Test for Residual Heterogeneity:
QE(df = 3) = 0.9806, p-val = 0.8060

Test of Moderators (coefficients 2:4):

QM(df = 3) = 3.2953, p-val = 0.3483

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.5073	0.2437	2.0815	0.0374	0.0296	0.9849	*
alcohol.rel	1.2492	1.7947	0.6960	0.4864	-2.2685	4.7668	
smoker.rel	-2.7348	1.8816	-1.4534	0.1461	-6.4226	0.9531	
drugs.rel	4.8347	3.5727	1.3532	0.1760	-2.1677	11.8371	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Smoker + Formertb

```
### fit mixed-effects model with alcohol, smoker and formertb as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + smoker.rel + formertb.rel,
data=dat)
res
```

Mixed-Effects Model (k = 8; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.0612)
tau (square root of estimated tau^2 value): 0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability): 1.00
R^2 (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:

QE(df = 4) = 3.1912, p-val = 0.5264

Test of Moderators (coefficients 2:4):

QM(df = 3) = 1.6441, p-val = 0.6494

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.4042	0.2531	1.5971	0.1102	-0.0918	0.9001
alcohol.rel	1.1483	1.0845	1.0588	0.2897	-0.9773	3.2739
smoker.rel	-0.2446	1.0335	-0.2367	0.8129	-2.2702	1.7809
formertb.rel	-0.8693	0.7508	-1.1579	0.2469	-2.3408	0.6022

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Smoker + Otherrf

```
### fit mixed-effects model with alcohol, smoker and otherrf as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + smoker.rel + otherrf.rel,
data=dat)
res
```

Mixed-Effects Model (k = 7; tau^2 estimator: REML)

tau^2 (estimated amount of residual heterogeneity): 0 (SE = 0.1015)
tau (square root of estimated tau^2 value): 0

I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 0.00%

Test for Residual Heterogeneity:
QE(df = 3) = 1.2822, p-val = 0.7334

Test of Moderators (coefficients 2:4):
QM(df = 3) = 1.8386, p-val = 0.6066

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3664	0.2176	1.6839	0.0922	-0.0601	0.7928
alcohol.rel	0.5741	2.4827	0.2312	0.8171	-4.2919	5.4400
smoker.rel	-1.1540	1.0868	-1.0618	0.2883	-3.2841	0.9762
otherrf.rel	0.6602	1.9919	0.3315	0.7403	-3.2439	4.5643

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Nohome + Drugs

```
### fit mixed-effects model with alcohol, nohome and drugs as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + nohome.rel + drugs.rel,
data=dat)
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

tau² (estimated amount of residual heterogeneity): 0 (SE = 0.0365)
tau (square root of estimated tau² value): 0
I² (residual heterogeneity / unaccounted variability): 0.00%
H² (unaccounted variability / sampling variability): 1.00
R² (amount of heterogeneity accounted for): 100.00%

Test for Residual Heterogeneity:
QE(df = 3) = 0.5410, p-val = 0.9098

Test of Moderators (coefficients 2:4):
QM(df = 3) = 4.5809, p-val = 0.2052

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3150	0.1161	2.7140	0.0066	0.0875	0.5425
**						
alcohol.rel	3.8509	3.2554	1.1829	0.2368	-2.5296	10.2314
nohome.rel	-14.8528	15.3587	-0.9671	0.3335	-44.9554	15.2498
drugs.rel	2.0987	4.9918	0.4204	0.6742	-7.6850	11.8825

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Nohome + Formertb

```
### fit mixed-effects model with alcohol, nohome and formertb as
moderators
```

```
res <- rma(yi, vi, mods = ~ alcohol.rel + nohome.rel + formertb.rel,
data=dat)
res
```

Mixed-Effects Model (k = 5; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.1834)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             100.00%
```

Test for Residual Heterogeneity:

QE(df = 1) = 0.5206, p-val = 0.4706

Test of Moderators (coefficients 2:4):

QM(df = 3) = 3.1348, p-val = 0.3713

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.3691	0.1574	2.3445	0.0191	0.0605	0.6777	*
alcohol.rel	1.5212	1.9204	0.7921	0.4283	-2.2428	5.2852	
nohome.rel	-0.6739	6.4760	-0.1041	0.9171	-13.3666	12.0188	
formertb.rel	-1.2908	1.4635	-0.8820	0.3778	-4.1592	1.5777	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Nohome + MDR

fit mixed-effects model with alcohol, nohome and mdr as moderators

```
res <- rma(yi, vi, mods = ~ alcohol.rel + nohome.rel + mdr.rel,
data=dat)
res
```

Mixed-Effects Model (k = 6; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0443)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):    1.00
R^2 (amount of heterogeneity accounted for):             0.00%
```

Test for Residual Heterogeneity:

QE(df = 2) = 0.1028, p-val = 0.9499

Test of Moderators (coefficients 2:4):

QM(df = 3) = 3.9119, p-val = 0.2711

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt	0.2930	0.1466	1.9982	0.0457	0.0056	0.5803	*
alcohol.rel	4.0895	2.7625	1.4803	0.1388	-1.3249	9.5039	
nohome.rel	-9.8907	9.4890	-1.0423	0.2973	-28.4889	8.7074	
mdr.rel	-1.6930	1.1366	-1.4895	0.1364	-3.9207	0.5347	

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Formertb + Otherrf

```
### fit mixed-effects model with alcohol, formertb and otherrf as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + formertb.rel + otherrf.rel,
data=dat)
res
```

Mixed-Effects Model (k = 7; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0.0336 (SE =
0.1382)
tau (square root of estimated tau^2 value):              0.1834
I^2 (residual heterogeneity / unaccounted variability): 19.65%
H^2 (unaccounted variability / sampling variability):     1.24
R^2 (amount of heterogeneity accounted for):              0.00%
```

Test for Residual Heterogeneity:
QE(df = 3) = 3.2890, p-val = 0.3492

Test of Moderators (coefficients 2:4):
QM(df = 3) = 0.0316, p-val = 0.9985

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3433	0.2940	1.1680	0.2428	-0.2328	0.9195
alcohol.rel	0.0428	2.3192	0.0185	0.9853	-4.5028	4.5884
formertb.rel	-0.1414	1.5433	-0.0916	0.9270	-3.1661	2.8833
otherrf.rel	0.1337	2.2302	0.0599	0.9522	-4.2375	4.5049

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

Mixed-Effects Model for RR of TB Mortality Males vs. Females with Moderators = Alcohol + Formertb + MDR

```
### fit mixed-effects model with alcohol, formertb and mdr as
moderators
res <- rma(yi, vi, mods = ~ alcohol.rel + formertb.rel + mdr.rel,
data=dat)
res
```

Mixed-Effects Model (k = 6; tau² estimator: REML)

```
tau^2 (estimated amount of residual heterogeneity):      0 (SE =
0.0957)
tau (square root of estimated tau^2 value):              0
I^2 (residual heterogeneity / unaccounted variability): 0.00%
H^2 (unaccounted variability / sampling variability):     1.00
R^2 (amount of heterogeneity accounted for):              0.00%
```

Test for Residual Heterogeneity:
QE(df = 2) = 1.2067, p-val = 0.5470

Test of Moderators (coefficients 2:4):
QM(df = 3) = 2.6505, p-val = 0.4487

Model Results:

	estimate	se	zval	pval	ci.lb	ci.ub
intrcpt	0.3183	0.2279	1.3966	0.1625	-0.1284	0.7649
alcohol.rel	1.4101	0.9825	1.4352	0.1512	-0.5156	3.3357
formertb.rel	-1.0695	1.2647	-0.8457	0.3977	-3.5484	1.4093
mdr.rel	-0.0646	0.8232	-0.0785	0.9375	-1.6781	1.5489

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