Tutorial 3 brief solution

(a) ICC = 0.45, which suggests moderate correlation between AMBC within subjects

(c)

Variable	***Estimated coefficient***	***95% CI****
Male	0.091	(0.032, 0.150)
Age	0.020	(0.011, 0.029)
$PM_{2.5}$	0.029	(0.026, 0.032)

*CI: confidence interval

(e) GEE with AR(1) structure was selected.

(f) GEE with AR(1):

Variable	***Estimated coefficient***	***95% CI****
Male	0.096	(0.019, 0.172)
Age	0.020	(0.008, 0.033)
$PM_{2.5}$	0.028	(0.024, 0.033)

*CI: confidence interval

(g) Linear mixed model with random intercept:

Variable	***Estimated coefficient***	***95% CI****
Male	0.094	(0.012, 0.177)
Age	0.020	(0.007, 0.032)
$PM_{2.5}$	0.028	(0.024, 0.032)

*CI: confidence interval

(h) ICC = 0.237

(i) Linear mixed model with random intercept and slope:

Variable	***Estimated coefficient***	***95% CI****
Male	0.092	(0.010, 0.175)
Age	0.021	(0.008, 0.034)
$PM_{2.5}$	0.027	(0.022, 0.032)

*CI: confidence interval

(j) All estimates are similar from different models, but the linear regression model is likely to have underestimated the uncertainty.

(k)

Variable	*Estimated coefficient*	*95% CI**
Male	0.131	(-0.001, 0.263)
Age	0.034	(0.014, 0.054)
$PM_{2.5}$ (visit 1)	0.004	(-0.026, 0.035)
$PM_{2.5}$ (visit 2)	0.009	(-0.034, 0.053)
$PM_{2.5}$ (visit 3)	0.025	(-0.018, 0.069)
$PM_{2.5}$ (visit 4)	-0.023	(-0.069, 0.023)
$PM_{2.5}$ (visit 5)	0.034	(0.003, 0.064)

*CI: confidence interval

(l)

Variable	*Estimated coefficient*
Male	0.119
Age	0.033
$PM_{2.5}$ (visit 1)	0.004
$PM_{2.5}$ (visit 2)	0.010
$PM_{2.5}$ (visit 3)	0.014
$PM_{2.5}$ (visit 4)	-
$PM_{2.5}$ (visit 5)	0.022

*CI: confidence interval