Boston Naming with cues: Predicted response levels at 0 exposure

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Predicted response levels at 0 exposure for the Boston Naming Test for a (hypothetical) child with covariate values equal to the covariate means. Also shown are 95% confidence intervals and 95% prediction intervals for the response level at 0 exposure.

Blood Mercury

Model	Prediction	95%-Confidence	95%-Prediction
log	30.17	(28.72; 31.63)	(20.41; 39.93)
square root	28.75	(27.96; 29.54)	(19.06; 38.43)
linear	28.00	(27.49; 28.51)	(18.32; 37.69)

Hair Mercury

Model	Prediction	95%-Confidence	95%-Prediction
log	28.76	(27.72; 29.81)	(19.04; 38.49)
square root	28.37	(27.62; 29.12)	(18.68; 38.07)
linear	28.06	(27.49; 28.61)	(18.37; 37.73)

Dose-response functions:

Logarithmic model: $\mu(d) = \beta \cdot \log(d+1)$
Square root model: $\mu(d) = \beta \cdot \sqrt{d+1}$
Linear model: $\mu(d) = \beta \cdot d$

d denotes the mercury concentration.

The logarithmic model estimate of the unexposed response level has the highest variance. In this model the distance between 0 and the mean transformed exposure is the largest relative to the sum of the squared distances to the mean transformed exposure of the observed exposures ($\frac{(0-\bar{t})^2}{SSD_t}$).

The estimation uncertainty of the unexposed response level is not taken into account in the benchmark calculation. Here the dose which causes a certain expected loss compared to an unexposed child is determined. In the models considered the estimate of the loss at exposure d depends on the mercury regression coefficient but not on the unexposed response level.