

Benchmark Dose Analysis from Multiple Datasets: The Cumulative Risk Assessment for the N-Methyl Carbamate Pesticides

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The US EPA's *N*-Methyl Carbamate (NMC) Cumulative Risk Assessment was based on the effect on acetylcholine esterase (AChE) activity of exposure to 10 NMC pesticides through dietary, drinking water, and residential exposures, assuming the effects of joint exposure to NMCs is dose-additive. The risk assessment used peak inhibition and the half-life of recovery from inhibition, which were estimated using dose-time-response modeling of animal studies. As there were multiple data sets for each chemical, hierarchical non-linear models, fit by approximate maximum likelihood methods, were used to simultaneously estimate the overall dose-time-response function for all relevant datasets. Relative potencies were calculated as the ratios of benchmark doses for 10% AChE inhibition. *This work was reviewed by EPA and approved for publication but does not necessarily reflect official Agency policy.*