Supplementary material

Benzene concentration multivariate model

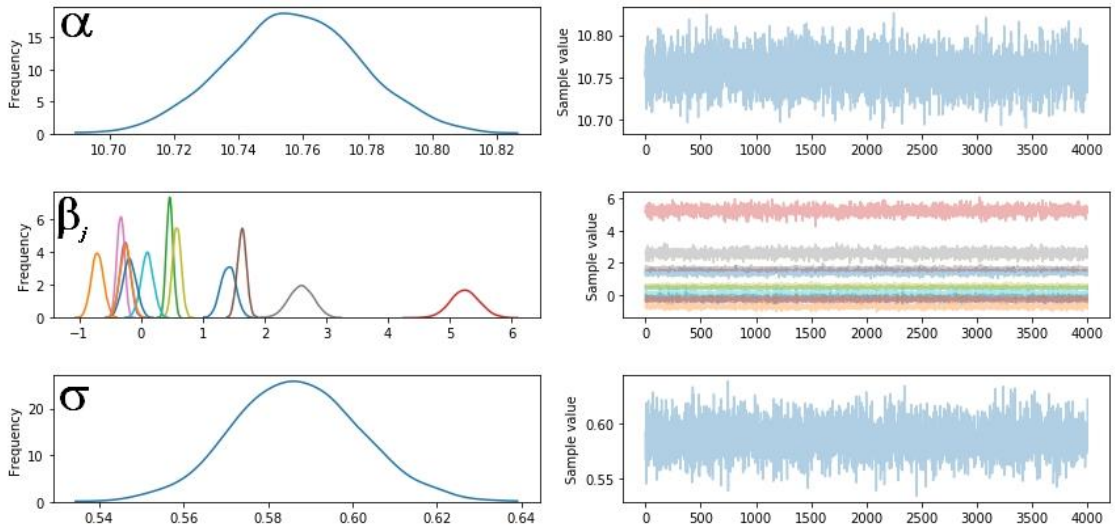

FIGURE S1. Gaussian FDP functions used in linear model parameters (left) randomly generated by Monte Carlo simulation, using values on the right.

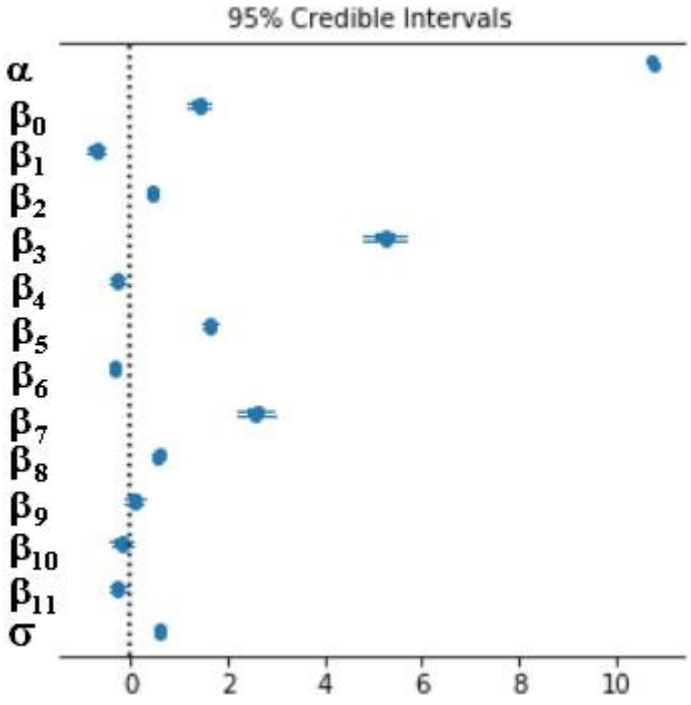

FIGURE S2. Mean values with error bars from the coefficients used in benzene multivariate model, generated in PyMC library.

β_0: true CO concentration
β_1: PT08.S1 sensor response
β_2: true non MHC concentration
β_3: PT08.S2 sensor response
β_4: true NOx concentration
β_5: PT08.S3 sensor response
β_6: True NO_2 concentration
β_7: PT08.S4 sensor response
β_8: PT08.S5 sensor response
β_9: Air temperature
β_{10}: Relative Humidity
β_{11}: Absolute Humidity

TABLE S1 β_j coefficients of bayesian model related to predictor variables for the benzene multivariate model (Figure S2).

	Mean	**St. Dev.**	**MC Error**	**Lower Lim.**	**Upper Lim.**
α	10.757	0.021	0.001	10.718	10.798
β_0	1,408	0.119	0.003	1.182	1.631
β_1	-0.710	0.095	0.002	-0.892	-0.534
β_2	0.465	0.051	0.001	0.367	0.557
β_3	5.219	0.228	0.007	4.795	5.665
β_4	-0.262	0.080	0.002	-0.410	-0.113
β_5	1.629	0.074	0.002	1.487	1.759
β_6	-0.326	0.057	0.001	-0.428	-0.214
β_7	2.613	0.185	0.005	2.285	2.983
β_8	0.578	0.070	0.002	0.452	0.711

β_9	0.100	0.105	0.003	-0104	0.292
β_{10}	-0.189	0.113	0.003	-0.404	0.022
β_{11}	-0.260	0.092	0.003	-0.418	-0.075
σ	0.587	0.015	0.001	0.559	0.613

TABLE S2 Numerical values of the bayesian model coefficients (Figure S2).

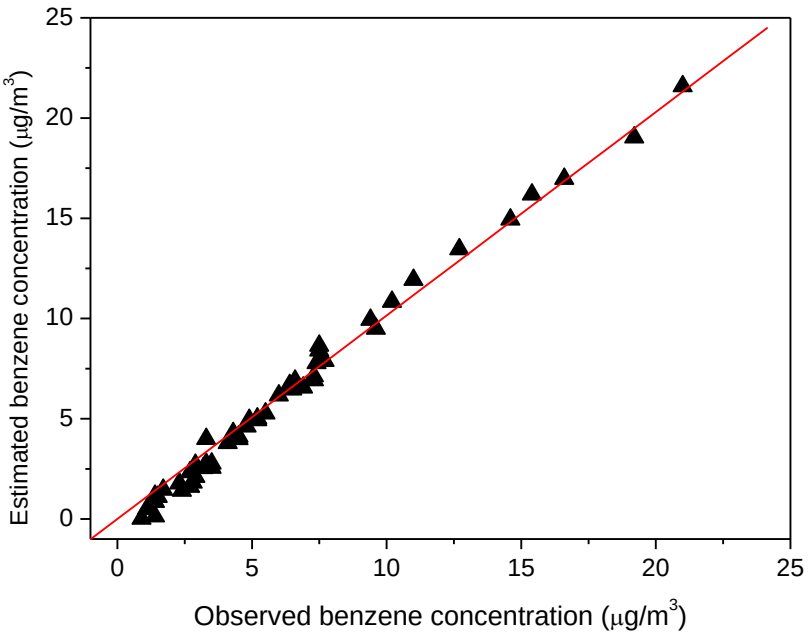

FIGURE S3. Dispersion of 50 samples in relation to the benzene concentration obtained from the bayesian probabilistic model, with correlation coefficient: 0.9961 and RMSEp: 0.5841 μg m^{-3}.

It was obtained RMSEp of 0.5841 μg m^{-3} and its coefficient of correlation R^2 of 0.9961, and RMSEc of 0.5805 μg m^{-3} and its coefficient of correlation R^2 of 0.9969.