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Sobol Sensitivity Analysis

The goal was to apply the US EPA model to assess how uranium exposure impacts human health for different age groups. Sobol sensitivity analysis was used to determine the relative importance of each input.

The Sobol indices tell us that input parameters with values greater than 0.1 were noted as highly sensitive, while sensitivity indices between 0.001 and 0.1 were noted as just sensitive. In the first-order effect, the concentration of uranium parameter was the most influential parameter, and body weight was the most insensitive parameter. Furthermore, the intake rate of drinking water had a higher Sobol score for children compared to adults, and adults had a higher Sobol value for the concentration of uranium and exposure frequency parameters. The big takeaway was that 17% of the total samples had concentrations of uranium that were above the recommended WHO level.

Parameter importance in this context is important to consider because highly sensitive parameters varied for the different age groups. This means that each age group requires a different solution so that it can be the most effective for that age group.

Works Cited

Kumar, Deepak, et al. “Sobol Sensitivity Analysis for Risk Assessment of Uranium in Groundwater.” *Environmental Geochemistry and Health*, vol. 42, no. 6, June 2020, pp. 1789–801. *DOI.org (Crossref)*, <https://doi.org/10.1007/s10653-020-00522-5>.