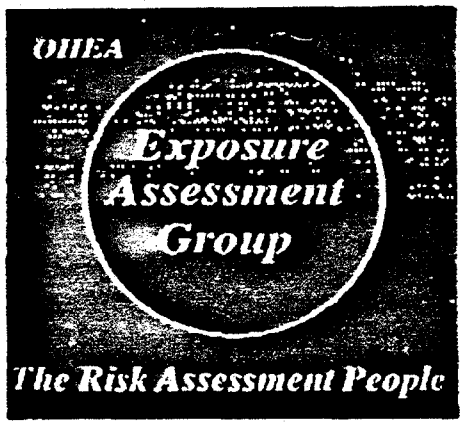

The Exposure Assessment Group
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COMMENTS:

Attached are our comments on the Chemkick reports re: Hudson River
3 pages + cover

In the following task, participants will use the data given, including the minimum and maximum values, in order to do a sensitivity analysis on the estimated LADDs. The analysis establishes the range of LADDs and allows the identification of the most sensitive parameter in its estimation. The Guidelines devote a lot of attention to the use of such sensitivity analyses to estimated exposures when there is limited available data, especially if the data were only sufficient to support estimates of the range of input variables (50/2). The data points used in this analysis are presumed to result from estimations, and not from actual measurements.

Task B: The exposure scenario for this exercise is the same as for Task A except that you now have additional data on the parameters used in the equation. In the information provided below, you have been given minimum and maximum levels for the parameters (derived through the use of estimation models) as well as the midpoint value that was used in Task A.

Using this data, and following the example shown below, conduct a sensitivity analysis showing how each parameter can affect the LADD estimate. Compute the sensitivity ratio for the minimum and maximum values for each parameter and identify which is the most sensitive parameter. Assume that the lifetime of the individual is 70 years and the body weight is 70 kg.

Parameter	Sensitivity Ratio
Ingestion rate (IR):	
min = 1 g/d	0.15
max = 12 g/d	1.85
mid = 6.5 g/d	
Concentration of X in fish (C):	
min = 1 ug/d	0.2
max = 10 ug/d	2.0
mid = 5 ig/d	
Diet Fraction (DF):	
min = 0.01	0.1
max = 0.2	2.0
mid = 0.1	
Exposure Duration (ED):	
min = 5 yr	0.5
max = 15 yr	1.5
mid = 10 yr	
Absorption Fraction (AF):	
min = 0.4	0.8
max = 0.6	1.2
mid = 0.5	

EXAMPLE:

$$\text{sensitivity ratio for IR-min} = \frac{\text{LADD based on IR-min \& mid values for others}}{\text{LADD based on mid values for all factors}}$$

$$= \frac{(1\ g/d)(5\ ug/g)(0.1)(10yr)(0.5)/(70yr)(70kg)}{(6.5\ g/d)(5\ ug/g)(0.1)(10yr)(0.5)/(70yr)(70kg)}$$

$$= 1/6.5$$

$$= 0.15$$

You should also be prepared to discuss the following:

- the purpose of the sensitivity analysis
- the range of LADD estimates you derived
- the characterization of uncertainty for the LADD

Additional information available to the facilitator:

- **The diet fraction is the most sensitive parameter since it can influence the exposure estimate the most (by 20 times).**
- **The purpose of the sensitivity analysis (50/2), with the use of input data such as we have in this case, would be to identify the most influential model input variables and also to develop bounds on the distribution of LADDs.**
- **For an exposure assessment of this type, the uncertainty would be characterized by describing the limitations of the data used to estimate the ranges of model input variables. Moreover, sensitivity to the model formulation can be investigated by replicating the sensitivity analysis for plausible alternative models (50/2,3).**

Use sensitivity analysis to identify most influential input variables

$x = f(a,b,c)$