

Speciation in risk assessment of soil

Nadja Lundgren, Tyréns

Part of a project in Sustainable Remediation (Hållbar Sanering)

Risk assessment

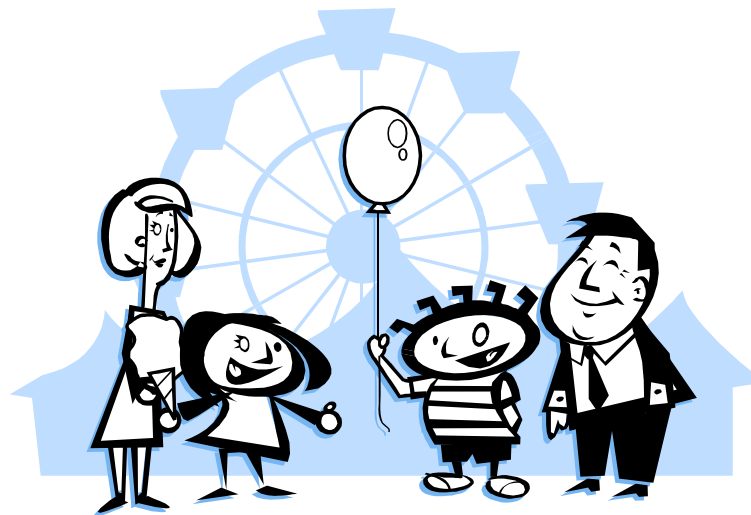
Guideline values for forms of metals:

Chromium (Cr III and Cr VI) in general risk assessment model

Swedish risk assessment model for contaminated soil

Risk assessment for

- ◆ Humans
- ◆ Organisms in soil
- ◆ Organism in nearby water



Routes of exposure for humans

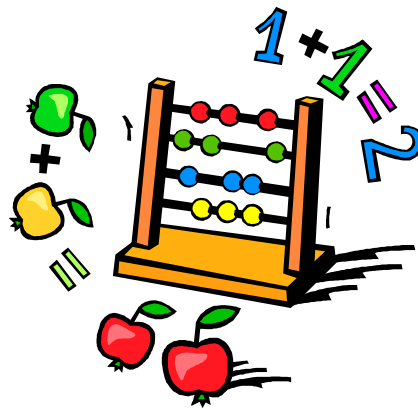
Intake of

- ◆ soil
 - ◆ dust
 - ◆ drinking water
 - ◆ fish
 - ◆ vegetables
-
- ◆ Vapour inhalation
 - ◆ Skin contact



Risk assessment of health

- ◆ One-way concentrations for each route of exposure calculated
- ◆ One-way concentrations weighed together to one concentration
- ◆ Adjustment for other sources of exposure, etc



Changes in model

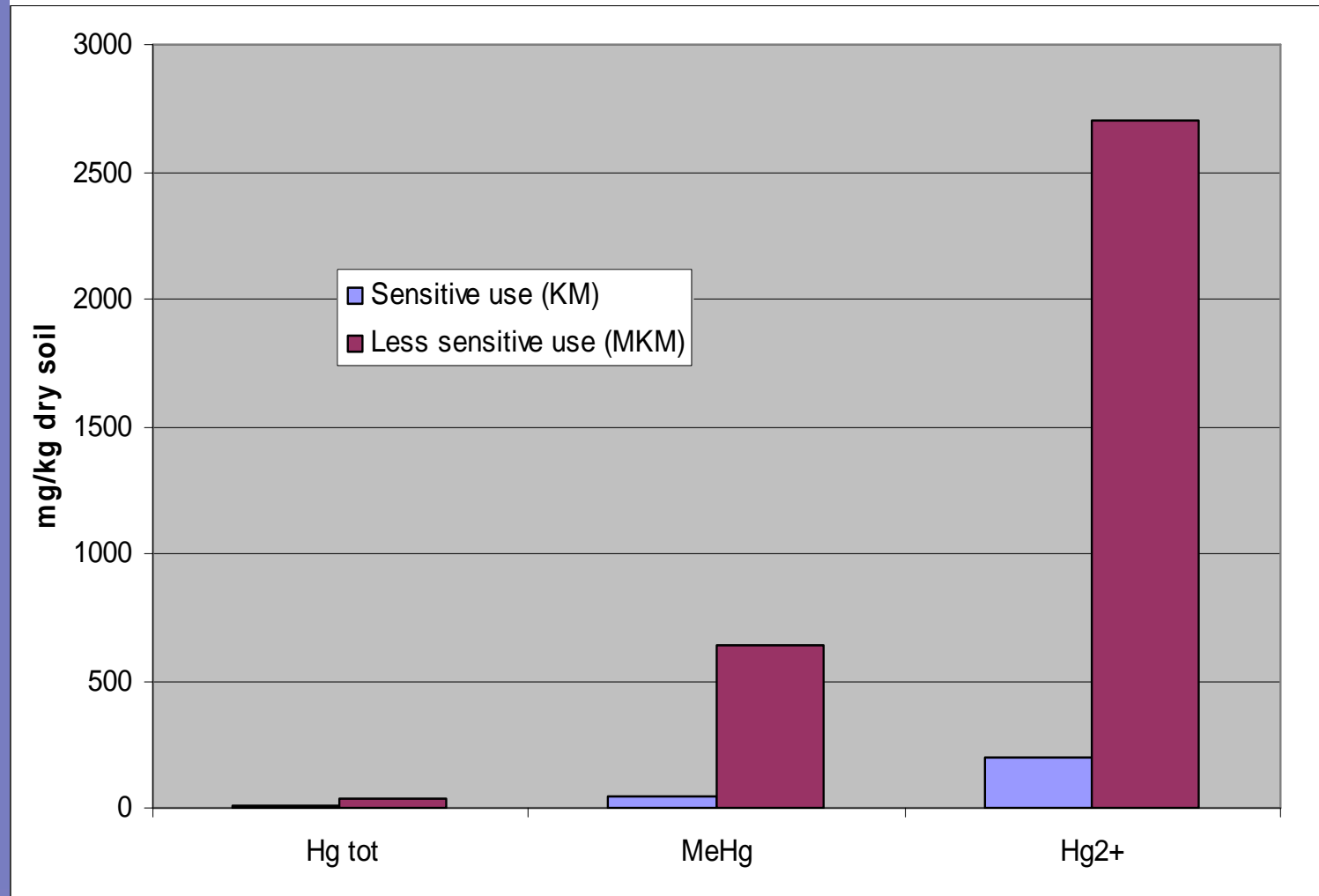
MeHg⁺

- ◆ Henry's constant H'

Hg²⁺

- ◆ Henry's constant H'
- ◆ Partition coefficient, K_d
- ◆ Tolerable daily intake, TDI

Risk assessment of health: One-way concentrations of Hg-forms in soil (not weighed together or adjusted)



Routes of exposure with most impact on guideline values

	Hg tot	MeHg	Hg ²⁺
Sensitive use (KM)	Vapour	Intake soil, drinking water & vegetables	Intake soil
Less sensitive use (MKM)	Vapour	Intake soil	Intake soil

?? Questions

- ◆ Hg-forms with most impact on risk?
(Concentrations in soil?)
- ◆ Time frame? How “stable” are the species?
- ◆ Overestimation of risk?
- ◆ Underestimation of risk?