Population-based metals concentrations in tap water consumed by young children in France

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Background & Objective

- **Toxicity of metals**
- **Exposure**: air, diet, **water**, soil & dust ingestion
- **Tap water ingestion**: drinking, milk preparation
- **Metal sources in tap water**
  - Raw water, Treatment, distribution
- **Objective**: In a perspective of total exposure assessment for children 6 months to 6 years
  - To assess As, B, Ba, Cd, Cr, Cu, Ni, Pb, Sb, Se, U concentrations in tap water consumed by children aged 6 months to 6 years in France
Method: survey design

A subsample of 484 children of a blood lead level survey, France 2007-2009 (Etchevers IJHEH 2013)

• Tap water consumption?

• **Sampling** of 2L of cold tap water in the kitchen, after flushing and 30 min stagnation time

• **Analysis:** inductively-coupled plasma mass spectrometer (ICP-MS)

• **Statistics:** sampling design and sampling weights
Discussion

• 2,977,123 children out of 4,923,058 drank tap water
• Some of them with concentrations in water above the 2011 WHO drinking water guidelines
  – 2000 (CI$_{95\%}$: 0-6100) over 70 µg/L for Ni
  – 78,500 (17,200-140,000) over 10 µg/L for Pb
• Strength: representativeness
• Limit: precision of estimates at the tail of distribution
Conclusion

• **Tap water concentrations** estimated for the population of young children drinking tap water in France
  – Whole dataset: 29 inorganic compounds: Al, As, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cu, Fe, Gd, K, Mg, Mn, Mo, Na, Nd, Ni, Pb, Sb, Se, Sr, Tl, U, V and Zn

• **Next step:** integrated exposure assessment (tap water + diet + soil & dust)
  – As, Cd, Cr, Cu, Mn, Pb, Sb, Sr, V
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