

# Annex 1: The testing protocol

Total mercury is tested in all samples.

**Testing method:** graphite furnace atomic absorption after microwave-oven digestion with a Perkin Elmer material SAA600. The full process is detailed in the document "Méthodologie dosage métaux dans cheveux".

**Quality control:** reference material used for the hair testing: CRM397 human hair produced by the Community Bureau of Reference, according to the guidelines set out in EU Publication "The certification of the contents of Cd, Hg, Pb, Se and Zn in human hair – CRM 397", Report EUR 13433.

**Quality assurance:** The Hygiène Publique en Hainaut (HPH) works with the Provincial Institute of Hygiène and Bacteriology of the Hainaut, certified and accredited ISO17025 "General requirements for the competence of testing and calibration laboratories". The T89 certificate is provided by Beltest (Belgian Accreditation Structure).

## 1. What is measured?

Total mercury level in hair is measure to include all sources of exposure and all forms of mercury (organic and inorganic).

The results gave a complete picture of the contamination but did not allow identification of the contribution of different sources of exposure to the total result.

The Provincial Institute of Hygiène and Bacteriology of the Hainaut is able to detect mercury at lower levels (approximately 0.1 ppb (parts per billion)).

## 2. Strengths and weaknesses of hair mercury testing

### Strengths:

- ▲ Non invasive method
- ▲ Integrates a few months' worth of exposure
- ▲ Biological matrix (tissue substance) does not degrade as rapidly as blood and urine
- ▲ Integrates internal and external exposure (for example, from air pollution, shampoo, hair cosmetics and so on)
- ▲ A correlation exists between mercury concentration in hair and others tissues.

### Weaknesses:

- ▲ Samples are susceptible to contamination during testing preparation.

## 3. References

Bencze K. 1994 Handbook on metals in clinical and analytical chemistry. Chapter 15: Determination of Metals in Human Hair.

Budtz-Jorgensen E, Grandjean P., Jorgensen P.J., Weihe P. and Keiding N. 2004. Association between mercury concentrations in blood and hair in methyl-mercury-exposed subjects at different ages. Environmental Research 95: 385-393.

Cerniciari E, Brewer R, Myers GJ, Marsh DO, Lapham LW, Cox C, et al. 1995. Monitoring methyl mercury during pregnancy: maternal hair predicts fetal brain exposure. Neurotoxicology 16:705-710.

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