

## EU-Harmonization in human biomonitoring of C-incidents

DiMoPEX



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### The role of human biological monitoring in civil protection in Germany

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The release of chemical, biological and radio-nuclear (CBRN-) agents creates special scenarios which can involve the exposure of disaster relief forces and the general public. Human biological monitoring (HBM) may be used in these incidents to determine the absorbed and biologically active internal dose of C-agents in the human body.

In a research project the compendium "Human biomonitoring in civil protection" was designed as a guideline for medical personnel to cover exposure of disaster relief forces and the general public after a CBRN incident. The compendium builds on HBM procedures, to be applied after exposure to chemical agents. HBM analysis methods were evaluated and basic toxicity data (including biological reference and threshold values) are given for 50 agents, previously identified as relevant in German civil protection. It also describes the sampling of human specimen to be analyzed for biological agents and radio-nuclear target isotopes, in a single sampling approach, thus limiting the burden for potentially exposed persons and facilitating comparison of their individual exposures to different CBRN agents (Müller et al., 2014).

In a second step, the compendium was implemented by a workshop of end users, training courses for medical personnel were designed and optimized by evaluation of the participant's feedback. In addition, an internet application was set up, including a periodically updated list of national and international HBM laboratories.

This development comprises a German approach for HBM in civil protection based on the obligate collection of human specimen and their subsequent analysis. Parallel developments in the Netherlands and Belgium use the concept of a transparent decision process for the application of HBM based on ambient monitoring data, simple dispersion modeling and toxicokinetic modeling (Scheepers et al., 2014). Both concepts have advantages and limitations. Nevertheless, these national approaches may serve as examples of a European concept to be developed for the application of HBM with ample and with limited resources of the respective countries.

#### References

Müller M, Schmiechen K, Heselmann D, Schmidt L, Göen T (2014) Human biological monitoring - A versatile tool in the aftermath of a CBRN incident. *Toxicol Lett* 231: 306 – 314.

Scheepers PT, van Brederode NE, Bos PM, Nijhuis NJ, van de Weerd RH, van der Woude I, Eggens ML (2014) Human biological monitoring for exposure assessment in response to an incident involving hazardous materials. *Toxicol Lett*. 231: 295 – 305

**This is an abstract accepted for the ISES 2016 meeting in Utrecht. It reflects the development of national HBM guidelines in C-incidents which may be harmonized in a common EU concept.**