

The Environmental Specimen Bank for Human Tissues as part of the German Environmental Specimen Bank

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International Journal of Hygiene and Environmental Health 210 (2007) 299-305

Abstract: The German Environmental Specimen Bank for Human Tissues (ESBHum) as part of the German Environmental Specimen Bank (ESB) focuses on documenting and assessing trends of human exposure via real-time-monitoring of body burden and long-term storage of samples under stable deep freezing conditions (-150°C) for later retrospective analyses. Real-time monitoring is performed after completing sampling processes of one year and covers actually 20 inorganic and 5 organic substances. While concentrations of several substances, e.g., arsenic, cadmium and mercury, are remained unchanged over time, other substances, e.g., lead and pentachlorophenol (PCP), show a clearly perceptible decrease. Substances which are not routinely analyzed in real-time-monitoring are retrospectively measured by indication in the stored human specimens. Indications of retrospective monitoring are availability of valid analytical methods, e.g., in case of PCDF and PCDD, or assessment of concentration trends of substances with actual interest of toxicology and/or environmental medicine, e.g., polybrominated diphenyl ethers (PBDE), perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). While over time the body burden of dioxins as well as PFOS and PFOA decreased, the PBDE concentrations in human blood increase. The observed decrease of blood lead and PCP levels over time is a consequence of legal prohibition and restriction. The time-dependent concentrations of the aforementioned substances agree with results of other national studies. So it can be concluded that the German ESBHum is an important instrument for health-related environmental observation and protection in Germany.