GUARDIANS OF HEALTH: ASSESSING HUMAN WELL-BEING IN THE GREEK E-WASTE & PLASTIC MANAGEMENT SECTOR THROUGH OCCUPATIONAL BIOMONITORING WITHIN THE FRAMEWORK OF THE PARC PROJECT AND EU POLICY PERSPECTIVES.

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ABSTRACT

The waste management sector is one of the most vital building blocks of the new Circular Economy Action Plan that the European Commission adopted. The European Green Deal is expected to increase the quantity of recycling waste streams and so the number of workers in waste management companies. However, workers are potentially exposed to hazardous substances that may lead to adverse health outcomes. The Occupational studies in the waste management sector aim to provide EU relevant data on chemical exposures of workers in the e-waste and plastics waste management industries, to update the health-based human biomarker guidance and limit values, and to adapt or create EU policies to protect human health. In this study, 15 partners from 11 countries of the EU (Portugal, Norway, Sweden, Italy, Belgium, Luxembourg, Greece, Finland, Denmark, Poland and Cyprus) are participating. The goal for the study population number for all the partners is 600 workers and 140 controls. Specifically, in Greece, 30 workers in e-waste stream, 30 workers in plastic stream, and 30 controls, are expected to participate. The study includes biological sampling of the participants, occupational hygiene sampling of the industries and the collection of contextual information to facilitate the interpretation of the biomarker results. The biomarkers of exposure of interest at biological specimens are the following: Cadmium, lead, PFAS (Per- and polyfluoroalkyl substances) and brominated flame retardants in blood; Metals, such as cadmium, lead, chromium, mercury, cobalt and aluminum, organophosphate flame retardants, phthalates and bisphenols in urine and mercury in hair. The effect biomarkers for analysis are PBL micronuclei, (frozen) comet assay, global DNA methylation, Glutathione (GSH/GSSG) in blood; Buccal micronuclei in Buccal cells and several Inflammatory markers in plasma. Also, metabolomics analysis will be conducted in urine. Furthermore, the compounds of interest in occupational hygiene samples are the following: Metals in air, settled dust & dermal wipes; also, flame retardants and phthalates in settled dust; brominated and organophosphate flame retardants, phthalates and bisphenols in Silicon wristbands.

KEYWORDS: Occupational exposure; Waste management; Human Biomonitoring; Biomarkers of exposure; Biomarkers of effect