

HEALS

Health and Environment-wide Associations based on Large population Surveys

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Assessing individual exposure to environmental stressors and predicting health outcomes implies that both environmental exposures and epi/genetic variations are reliably measured simultaneously. HEALS brings together in an innovative approach a comprehensive array of novel technologies, data analysis and modeling tools that support efficiently exposome studies.

The **general objective** of HEALS is the refinement of an integrated methodology and the application of the corresponding analytical and computational tools for performing environment-wide association studies in support of EU-wide environment and health assessments. The exposome represents the totality of exposures from conception onwards, simultaneously identifying, characterizing and quantifying the exogenous and endogenous exposures and modifiable risk factors that predispose to and predict diseases throughout a person's life span. The HEALS approach brings together and organizes environmental, socio-economic, exposure, biomarker and health effect data; in addition, it includes all the procedures and computational sequences necessary for applying advanced bioinformatics coupling thus effective data mining, biological and exposure modeling so as to ensure that environmental exposure-health associations are studied comprehensively. The overall approach will be verified and refined in a series of population studies across Europe including twin cohorts, tackling different levels of environmental exposure, age windows of exposure, and socio-economic and genetic variability. The HEALS approach will be applied in a pilot environment and health examination survey of children including singletons and sets of twins with matched singletons (each twins pair having also a matched singleton) covering ten EU Member States (the EXHES Study).

The lessons learned will be translated into scientific advice towards the development of protocols and guidelines for the setting up of a larger European environment and health examination survey.

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