Public health impact of long-term, low-level mixed element exposure in susceptible population strata

Fact Sheet

Project Information

PHIME
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Overall budget € 15 052 317
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Coordinated by LUNDS UNIVERSITET Sweden

Objective

Abstract The project will contain four pillars, each with several work packages (with several sub-projects). In addition, there will be cross-cutting work packages. I. What are the problems? i) We will epidemiologically assess the impact of toxic metals (particularly cadmium, mercury, lead and manganese) exposure through foods on diseases of public health concern (nervous system, cardiovascular, osteoporosis/fractures, kidneys, diabetes). Some studies will utilize unique biobank material. ii) Particular interest will be paid to interaction between toxic elements in mixed exposures (several metals and other pollutants), and on ???new??? elements (platinum, palladium, rhodium and manganese). iii) We will characterize benefits of exposures to essential elements (selenium, zinc)/other dietary components (fatty acids, fibre), and describe some aspects of risk/benefit relationships. iv) We will address pathomechanisms. v) We will focus on susceptible groups (fetuses/infants/children, fertile women and elderly, nutrition and gene-environment interactions), as regards metabolism and toxic effects. II. Where are the problems?
interactions), as regards metabolism and toxic effects. II. Where are the problems?

vi) We will develop and validate new methods for biomonitoring of exposures. vii) We will define geographical patterns/sources of exposure in EU Member States, especially in children and women. viii) We will assess time trends of exposure, retrospective and prospectively. III. Possible solutions to the problems

ix) We will develop probabilistic models, describing the exposures and exposure-response patterns. This will enable scientifically-based decisions by national, EU and international bodies on preventive actions. x) We will explore mechanisms of uptake and distribution of toxic and essential elements in plants, which will make it possible to breed species with low concentrations of toxic elements and high of essential. This gives a possibility to change the intakes through plant foods and the transportation into animal foods.
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