

THE PROJECT OUTLINE

Study in model areas on the environmental and health impact of some emerging chemical contaminants (endocrine disruptors): *living environment, reproductive outcomes and repercussions in childhood* (PREVIENI)

Three-year Project (2008-10) financed by the Italian Ministry for Environment and Protection of Territory and Sea

Coordinator

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Research Units (RU)

1. Istituto Superiore di Sanità (ISS) - resp. Alberto Mantovani, director of the Food and Veterinary Toxicology Unit
2. S. Andrea Hospital, Gynaecological Sciences, Perinatology and Neonatology Dept. University of Rome La Sapienza, II Faculty of Medicine and Surgery - resp. Donatella Caserta, Full Professor of Gynaecology and Obstetrics.
3. Environmental Sciences Dept., University of Siena - resp. Silvano Focardi, Chancellor of the University of Siena.
4. World Wildlife Fund Italy.

PREVIENI's Objectives

- the investigation of the impact on human fertility of exposure to food and environmental contaminants that modulate endocrine activity (endocrine disruptors, EDCs)
- the pilot investigation on the risk of transgenerational exposure to EDCs.
- the study of the link between environment and health through the investigation of EDCs exposure and associated biomarkers in wildlife

The study includes the following research activities with the involvement of the following RUs:

- A. Study on male infertility *sine causa* (RU 1, RU 2, RU 3)
- B. Pilot study on transgenerational exposure (mother-child transfer) to EDCs (RU 1, RU 2, RU 3)
- C. Study on sentinel animal populations in two WWF oasis (RU 3, RU 4).

Expected Results and Impacts

1) Risk analysis

- Output of reliable informations, at national level, for the assessment of actual risks for reproductive health and childhood resulting from contaminants as well as from the potential role of modulating factors linked to diet and lifestyles.
- Risk analysis for vulnerable population subgroups: children, subjects with metabolic disturbances.
- Transgenerational exposure analysis as a basis for specific prevention and health promotion measures
- Evaluation of biomarkers of exposure, effective dose and effect, including novel biomarkers based on gene expression assessment.
- Contribution to the elaboration of protocols and guidelines for the identification, study and treatment of the effects on fertility as well as on the health of the foetuses and newborn.
- Contribution to the identification of certain metabolic conditions usable as potential factors of susceptibility in the Italian population, through the comparison among the different areas under study.

3) Prevention strategies improvement

- Development of integrated methodologies applicable by the health structures of the SSN (Italian National Health System) for prevention of risk factors associated with environment and lifestyle.
- Comparison of data on humans with data on animal species living in the same area and potentially exposed to the same contaminants, in order to identify a sentinel system able to protect living beings from persisting substances potentially toxic for the environment.
- Dissemination for a more accurate citizen information on risks related to environmental pollutants exposure.

4) Impact on prevention and surveillance of environmental effects on ecosystems and human health.

- Analysis of the effect of EDCs bioaccumulation phenomena in the same animal species from neighbouring areas differentially exposed to chemical pollution of industrial origin.
- Characterization of species more sensitive to the variation in levels of environmental contamination.
- Evaluation of possible low-trophic level sentinel species for timely surveillance of EDCs environmental contamination at early stages.
- Evaluation of levels of "emerging" contaminants in humans and in some animal species of interest for Italian ecosystems
- Scientific databases for the evaluation of possible health and environmental surveillance programme updates, including the introduction of emerging contaminants in monitoring programmes
- Characterization of possible bioindicators, including biomarkers of EDCs exposure, for population's monitoring in accordance with the recommendations from the European Strategy for Environment and Health.
- Characterization of markers in order to prevent EDCs effects on reproductive health and next generation.