

Research Interests

My research field includes epidemiological studies focusing on the health effects of the environment. I am also interested in genetic determinants of health, in particular the joint effects of genetic and environmental factors, i.e. evaluating whether genetic determinants or genetic polymorphisms interact with environmental exposures to modify disease risk (gene-environment interaction).

From outcome-oriented approach my research field covers:

- Respiratory epidemiology
- Reproductive epidemiology
- Cardiovascular epidemiology

From the determinant-orientated approach my research area can be divided into five major fields:

- Water disinfection by-products (DBPs) and reproductive outcomes
- Ambient air pollution and children health
- Occupational exposure and cardiovascular disease.
- Indoor environment and children health
- Radiation and cytogenetic effects

My further research interests are in the development of exposure and risk assessment including:

- Develop regression analysis for correlated responses. There are two situations of interest: 1) when observations come in clusters, for example in longitudinal research or in sample surveys; 2) when a single time series is observed. Extended generalized linear models (logistic, linear, log-linear and survival models) using general estimation equation (GEE) will be applicable in these cases.
- Develop statistical models for multi-site time series and cohort study in the relation between ambient air pollution and health, such as a Bayesian hierarchical approach to pool information across clusters in order to derive more precise estimates of cluster-specific parameters and cluster-level effects.
- Develop job-exposure matrices and analytical methods in environmental and occupational epidemiology, such as case crossover study.
- Apply Geographic Information System (GIS) on the basis of information on address of subjects, traffic flow, population density, temperature, seasonal variation, outdoor and/or indoor air pollutant data, and integrate living activities to refine individual exposure assessment.
- Perform a systematic literature review (Meta analysis) of environmental or occupation exposure in relation to carcinogenic and reproductive outcomes.

I have wide experience in planning and conducting cross-sectional, cohort, case-control and intervention studies and use of nation-wide registry-based health and environmental information in Taiwan, Finland, Norway, and the United Kingdom. I have a wide international experience in research with projects and collaboration in Finland, Norway, and United Kingdom. I have previously studied Ph.D. program in the Environmental and Occupational Epidemiology, Department of Epidemiology, Johns Hopkins University Bloomberg School of Public Health in the United States and worked with the University of Helsinki and University of Oulu in Finland, National Institutes of Public Health in Norway, The Nordic School of Public Health in Sweden and University of Birmingham in the United Kingdom.