



HAL
open science

Radiological component of the Exposome, multiple exposures, risks of cancer and other chronic diseases in the Constances cohort (CORALE)

Olivier Laurent, Philippe Renaud, Serge Dreuil, Claire Greau, Caroline Vignaud, Sophie Ancelet, Olivier Armant, Marie-Odile Bernier, Enora Clero, Christelle Durand, et al.

► To cite this version:

Olivier Laurent, Philippe Renaud, Serge Dreuil, Claire Greau, Caroline Vignaud, et al.. Radiological component of the Exposome, multiple exposures, risks of cancer and other chronic diseases in the Constances cohort (CORALE). ERPW2021 - 5th European Radiation Protection Week, Nov 2021, Vienne, Austria. , 2021. irsn-04032729

HAL Id: irsn-04032729

<https://irsn.hal.science/irsn-04032729>

Submitted on 16 Mar 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

Radiological component of the Exposome, multiple exposures, risks of cancer and other chronic diseases in the Constances cohort (CORALE).



Olivier Laurent¹, Philippe Renaud¹, Serge Dreuil¹, Claire Greau¹, Caroline Vignaud¹, Sophie Ancelet¹, Olivier Armant¹, Marie Odile Bernier¹, Enora Clero¹, Christelle Durand¹, Teni Ebrahimian Chiusa¹, Marcel Goldberg², Emeline Lequy², Stephane Grison¹, Chrystelle Ibanez¹, Géraldine Ielsch¹, Dmitry Klovov¹, Virginie Monceau¹, Herve Roy¹, Chantal Guihenneuc³, Klervi Leuraud¹, Marie Zins².

1. Institut de Radioprotection et de Sûreté Nucléaire, Fontenay-aux-Roses/Cadarache, 2. UMS 011 Inserm/UVSQ/UParis/UP Saclay "Cohortes épidémiologiques en population, Villejuif, 3. BioSTM — EA 7537, UParis

Context

Throughout life, people are exposed to ionizing radiation (IR) at varying levels, via multiple natural and artificial sources, whether in the context of the residential environment, various activities (professional or other such as air travel) or for medical reasons (diagnostic or therapeutic procedures). The carcinogenic effects of IR are well documented at dose levels of 100 milliGrays (mGy) or higher. There is still controversy about the shape of the relationships between exposure and cancer risks at lower doses. In addition, the quantification of the effects of multi-exposure to IR and other cancer risk factors is poorly documented. Similarly, the relationships between exposures to IR at different stages of life (e.g., during childhood, puberty, etc.) and late health effects remain poorly characterized. Associations between low doses of IR and non-cancer chronic diseases also require better documentation.



Objectives

- to carry out the broadest possible reconstruction of doses of IR from environmental sources (radon, terrestrial and cosmic radiation, food, nuclear installations and other artificial sources), medical (diagnostic and therapeutic procedures) and occupational exposures received by participants of the French Constances cohort since birth, following the logic of the exposome concept (for its radiological component).
- to estimate the risks of cancers and other chronic diseases potentially associated with the cumulative doses received (from several sources of IR and over time) taking into account the possible influence of multi-exposures to other risk factors.

Methods

In order to reconstruct the annual doses of IR received by about 85 000 members of the French Constances cohort since their birth, reconstructions related to environmental, medical and occupational exposures will be performed by different units of IRSN in collaboration with the Constances cohort team (Inserm/UVSQ/UParis).

The statistical analyses (e.g., Cox models with time-dependent covariates) will benefit from the expertise of radiobiologists, supporting the exploration of specific hypotheses and interpretations. The use of advanced Bayesian probabilistic models allowing to deal with multi-exposures will be explored.

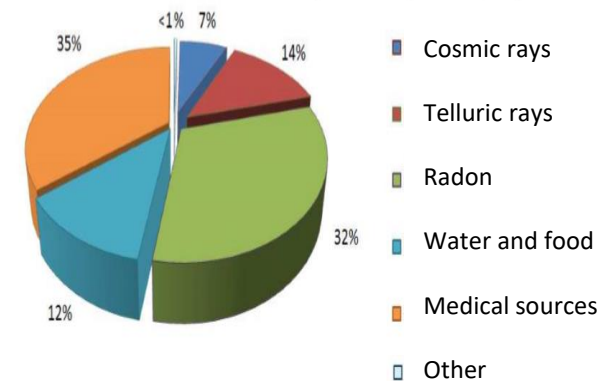
Perspectives

The CORALE project will start in January, 2022. It is part of a broader long-term research programme, which will include investigation of the effects of other multi-exposures (e.g., IR and environmental exposures to chemicals) and the study of risks and exposure biomarkers through the Constances biobank.

Funding

This project is funded by and the European Commission (RadoNorm <https://www.radonorm.eu/>) and the Fondation de France.

Average exposure to IR of the French population (IRSN 2015, 2021) <https://expop.irsrn.fr/>



Projet soutenu par



Contact : olivier.laurent@irsrn.fr