

Abstract title: Residential radon exposure during childhood and late health effects at adult age, in the CONSTANCES cohort

Authors: Olivier Laurent, Choisie Mukakalisa, Emeline Lequy, Marcel Goldberg, Corinne Mandin, Céline Ribet, Marie Zins, Enora Cléro

Abstract:

Introduction

Radon exposure is an established risk factor for lung cancer. Over the recent decades, a growing number of epidemiological studies have investigated other possible health effects of radon exposure, but results are inconsistent. No study has focused on radon exposure during childhood and health outcomes at adult age. The objectives of this project are: 1/ to carry out a reconstruction of residential radon exposure from birth until 2019 in a large cohort; 2/ to estimate the risks of cancers and other chronic diseases at adult age potentially associated with radon exposure and doses to specific organs, especially during childhood.

Methods

Individuals were selected from the French CONSTANCES population-based adults cohort recruited between 2012 - 2017. We included in our study participants with a completed residential history since birth, and who gave their consent to the use of data concerning them from the French national health system (SNDS). Radon exposure was reconstructed by linking residential histories with a map of indoor radon concentrations by municipalities. Incident case of chronic diseases were identified over the period 2010-2021. Cancer and non-cancer risks will be estimated using survival models.

Results

Initially 58,697 participants provided a residential history since birth, and 57,571 (46% males) of them were identified in the SNDS. Mean age at recruitment was 48.8 years. The median annual radon

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exposure during childhood (0 -15 years) was 59 Bq/m³. At this stage, incident cases for the following diseases have been identified: 104 lung, 406 colorectal, 1251 breast and 735 prostate cancers, 612 strokes, 291 heart failures, and 1703 coronary heart diseases.

Discussion

Statistical analyses adjusting for potential confounders will be undertaken to investigate the relationships between these diseases and radon exposure as well as related organ doses, especially during childhood but also considering the influence of doses at later ages.