

Abstract title: Reconstruction of the radiological component of the exposome in the CONSTANCES cohort: first step of the CORALE project.

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Abstract:

Introduction: The aim of the CORALE project is to integrate for the first time, year by year, the exposures to ionising radiation (IR) received by individuals since birth and to study their associations with chronic diseases, in the French population-based CONSTANCES cohort. The present work focuses on reconstructing the IR doses to organs at several stages of life.

Methods: A questionnaire was sent to 76,693 volunteers from the CONSTANCES cohort. Some environmental exposures are reconstructed by linking residential histories since birth with radioactivity maps (radon, terrestrial gamma and cosmic rays, and artificial sources) and other through a questionnaire (e.g. on their dwelling – type, floor; on their diet – unfiltered tap water, local mushroom and seafood consumption; on their flights). Occupational exposures will be reconstructed based on a national registry dedicated to IR exposure at work. Medical exposures to IR will be identified through the National Health Data System from 2007 onwards and by a questionnaire for the pre-2007 period.

Results: So far 28,730 participants replied to the questionnaire. In terms of lifestyles linked to environmental exposure, 60.5% of respondents ate shellfish and 37.6% ate local mushrooms and 79.1% have flown at least once in their lives. Regarding medical exposure prior to 2007, 30.6% of respondents reported having had at least one scanner and 16.8% an X-ray with contrast agent. Among women, 43.1% reported having had at least one mammogram. Dose estimates to 6 organs (brain, thyroid, lung, breast, colon, and prostate) are currently being derived.

Discussion: The survey remains open, allowing responses from other participants to be recorded. These data are essential to the CORALE study, allowing for the most exhaustive reconstruction of IR as possible throughout life, and will be precious for epidemiological analyses.