

## EPI-CT

Gaining a better understanding of radiation-related risks in the medical field



The aim of the European EPI-CT research project is to enable better assessment of the risks related to patient exposure to low doses of radiation, particularly within the framework of x-rays or scans. A better understanding of risks in relation to dosimetry should allow for the formulation of medical best practices, particularly for paediatric diagnosis.

### INSPIRATION

It is widely accepted that exposure to very high doses of radiation (following a nuclear disaster for example) could lead to the development of cancer. At present, however, it is still very difficult to assess the effect of exposure to low doses, as is the case in the medical domain during a scan, x-ray or mammography. "In this context, it's not easy to establish a link between exposure and risks", explains LIST researcher Andreas Jahnen. "We don't have the necessary long-term data to determine the nature of the link that exists between low exposure and the risk of developing cancer." Launched in 2011 and rolled out in nine European countries, the EPI-CT project aims to gain a better understanding of this link. LIST is one of the project's 17 partners. "We needed to work on a sufficiently large, representative sample in the hope of drawing conclusions confirming or disproving the various hypotheses put forward today", continues Jahnen. EPI-CT has chosen to focus on cases of paediatric patients who, as part of their diagnosis or medical treatment, have been exposed to low doses of radiation during scans. The scope of the project allows the research to draw on a representative sample of one million children.

### INNOVATION

One of the challenges for successfully completing this project is being able to collect the data relating to the children's treatment, including the radiation doses to which they were exposed during their treatment and the risks that could be linked to this exposure. To achieve this, EPI-CT has analysed data and archives drawn from hospital IT systems – RIS and PACS. "Before conducting our analysis, we had to extract and process data related to scans of paediatric patients over the past 15 years," says Jahnen. "At LIST, we worked on developing software allowing us to extract and analyse pertinent data and link it to dose/patient data." LIST was involved in developing this software based on an existing solution – NCICT – allowing for the establishment of an accurate dose/patient link. "Today, this software allows us to determine the dose to which a patient's various organs were exposed during a given scan", explains Jahnen.

### IMPACT

The project will conduct an analysis of the cancer registry, a European database listing the cases of cancer in children, allowing for these cases to be linked to the data collected and processed via the software solution developed with LIST's input. "This cross-referencing of data should give us a better understanding of the risk", continues Jahnen. "The collected and processed data should also allow us to assist stakeholders in the medical field, by bringing about progress in practices and technology. One of the challenges is to identify and develop the most suitable protocols for the medical examination of a child, with a view to limiting exposure and, consequently, potential risks."

### Partners

International Agency for Research on Cancer (FR) , University Medical Center of the Johannes Gutenberg University Mainz (DE) , Radiation and Nuclear Safety Authority - STUK (FI) , Karolinska Institutet (SE) , University Of Newcastle Upon Tyne (UK) , Centre for Research in Environmental Epidemiology – CREAL (ES) , Institut National de la Santé et de la Recherche Médicale - INSERM (FR) , Danish Cancer Society (DK) , Netherlands Cancer Institute - Antoni Van Leeuwenhoek (NL) , Centre d'Assurance de qualité des Applications technologiques dans le domaine de la Santé (FR) , Norwegian Radiation Protection Authority (NO) , Oslo Universitetssykehus Hf (NO) , Institut Curie (FR) , Ghent University (BE) , Federal Office for Radiation Protection (DE) , Institut de Radioprotection et de Sûreté Nucléaire - IRSN (FR) , Belgian Nuclear Research Centre (BE)

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