
Exposure of the population to ionising radiation from diagnostic medical imaging procedures in France in 2022

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Résumé

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Exposition de la population aux rayonnements ionisants due aux actes d'imagerie médicale diagnostique réalisés en France en 2022

Introduction: This study aims to establish data on the exposure of the French population to ionising radiation from medical imaging for diagnosis purposes (conventional, dental and interventional radiology, computed tomography and nuclear medicine) for the year 2022 and to analyse evolution in such data.

Material and Methods: The study is based on diagnostic imaging procedures taken from the National Health Data System Sample, representing approximately 2 % of the healthcare consumption of the population covered by the French health insurance schemes.

In accordance with European recommendations (1), the exposure of individuals to ionising radiation from diagnostic procedures was assessed in terms of effective dose.

Population exposure was estimated by associating an average effective dose with each type of procedure.

The average effective dose associated with each procedure was determined as close as possible to clinical practice in 2022, thanks to the collection of dosimetric data in the frame of diagnostic reference levels (2).

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Results: In 2022, 42.6 % of the French population underwent one or more diagnostic imaging procedure, slightly down compared to 2017 (45.4 %) (3).

Compared with 2017, the overall annual frequency of procedures has fallen by around 8 %, from 1,181 to 1,083 procedures per 1,000 beneficiaries in 2022. This overall decrease is mainly due to a reduction of around 19 % in conventional radiology procedures. In contrast to this general trend, the frequency of CT scan procedures and diagnostic nuclear medicine procedures increased by around 11% and 22% respectively.

The average per caput annual effective dose has risen very slightly to 1.57 mSv in 2022, compared with 1.53 mSv in 2017.

Although CT scan accounts for only a small number of procedures (15.6 %), it increased and remained by far the highest contributor to collective effective dose (75.5 %). Nuclear medicine, the third largest contributor to collective effective dose, also increased. This was the modality with the largest increase between 2017 and 2022, both in frequency and, consequently, in contribution to collective effective dose.

Conclusions: Despite the fall in the frequency of conventional radiology procedures, leading to a fall in the total frequency of procedures, and despite a general trend towards lower doses per procedure, the French population's exposure to medical diagnoses remained stable.

References

- (1) European Commission, " Medical Radiation Exposure of the European Population ", Radiation protection n°180, 2015.
- (2) IRSN, " Analysis of data for updating diagnostic reference levels in radiology and nuclear medicine 2019 - 2021 report ", Report IRSN 2023-00577, August 2023.
- (3) IRSN, " Exposure of the population to ionising radiation from diagnostic medical imaging procedures in France in 2017 ", Report No.: IRSN /2020-00564, August 2020.

Mots-Clés: medical exposure, radiation protection, medical imaging, nuclear medicine, effective dose