

Oncologists' knowledge, attitudes and needs about artificial intelligence in clinical oncology in Luxembourg in 2026: a national cross-sectional survey (AICO study)

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Introduction: Artificial intelligence (AI) is rapidly entering the field of medical oncology. Clinician literacy, ethical awareness, and governance structures are prerequisites for safe implementation, yet real-world data on adoption, training and ethical perceptions from small European healthcare systems remain scarce.

Methods: We conducted an anonymous national cross-sectional online survey among all practicing physicians (medical oncologists, radiation oncologists, haematologist-oncologists) and oncology residents in Luxembourg (n = 42 eligible) between January and February 2026. The instrument covered AI knowledge, use, attitudes, ethical/legal perspectives, barriers and training needs. Proportions are reported with 95% Wilson score confidence intervals; analyses were descriptive.

Results: In total 25 physicians responded (59.5%), 88% (95% CI 70.0–95.8) of whom had no formal AI training. All respondents had used large language models (LLMs), with 52% (33.5–70.0) reporting professional use for non-clinical tasks and 20% (8.9–39.1) for clinical decision support. Most participants (84%; 65.3–93.6) supported the use of AI as a clinical decision-support tool, yet 88% (70.0–95.8) of physicians perceived they would bear primarily legal responsibility for AI-related errors. The main barriers to implementation were lack of validated tools (68%; 48.4–82.8) and regulatory/legal uncertainty (64%; 44.5–79.8). Notably, 76% (56.6–88.5) of respondents reported encountering patients who brought AI-generated medical information to consultations.

Discussion: AI adoption among oncologists in Luxembourg is already widespread, including emerging clinical use, despite limited formal training and unresolved medico-legal frameworks. This “implementation-governance gap” highlights the need for structured education, validated clinical tools, and regulatory clarity to ensure safe and ethically sound integration of AI into oncology practice.

Biosketch

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CURRENT AND PAST POSITIONS

01/2012-03/2017: Residency in Internal Medicine, Hematology, Oncology, Rheumatology, Department of Internal Medicine I, Saarland University Medical Center.

03/2017: Specialist in internal medicine (Internist).

04/2017-2021: Attending physician (Oberarzt); 04/2017-08/2019 Head of the emergency department, Head of the HIV outpatient clinic, clinical responsibility for wards and outpatient clinics.

03/2020: Specialist in hematology and oncology.

07/2020: Managing senior physician (UKS, Internal Medicine I).

11/2020: Coordinator of the Centre for hematologic neoplasia (DKG).

Since 10/2021: Centre Hospitalier du Nord, Luxembourg, Consultant hematology and oncology, internal medicine; Partner/owner, Oncopraxis, Ettelbruck.

EDUCATION

10/2005-12/2011: Saarland University, Study of human medicine.

12/2011: MD degree (Staatsexamen).

06/2013: Doctoral thesis (Dr. med.), magna cum laude.

07/2023: Venia legendi (habilitation) in internal medicine (Privatdozent / assoc. Professor), Saarland University Faculty of Medicine.

OTHER RELEVANT PROFESSIONAL ACTIVITIES AND ACCOMPLISHMENTS

Reviewer for scientific peer-reviewed journals (e.g. Blood Advances, Annals of Hematology, Acta Haematologica, Frontiers in Oncology, BMC Cancer).

03/2017: Acquisition of the additional title "Emergency medicine".

07/2018: Acquisition of the additional title "Palliative care".

11/2021: Acquisition of the additional title "Clinical acute and emergency medicine".

11/2023: ESMO Examination (certificate for medical oncologists).