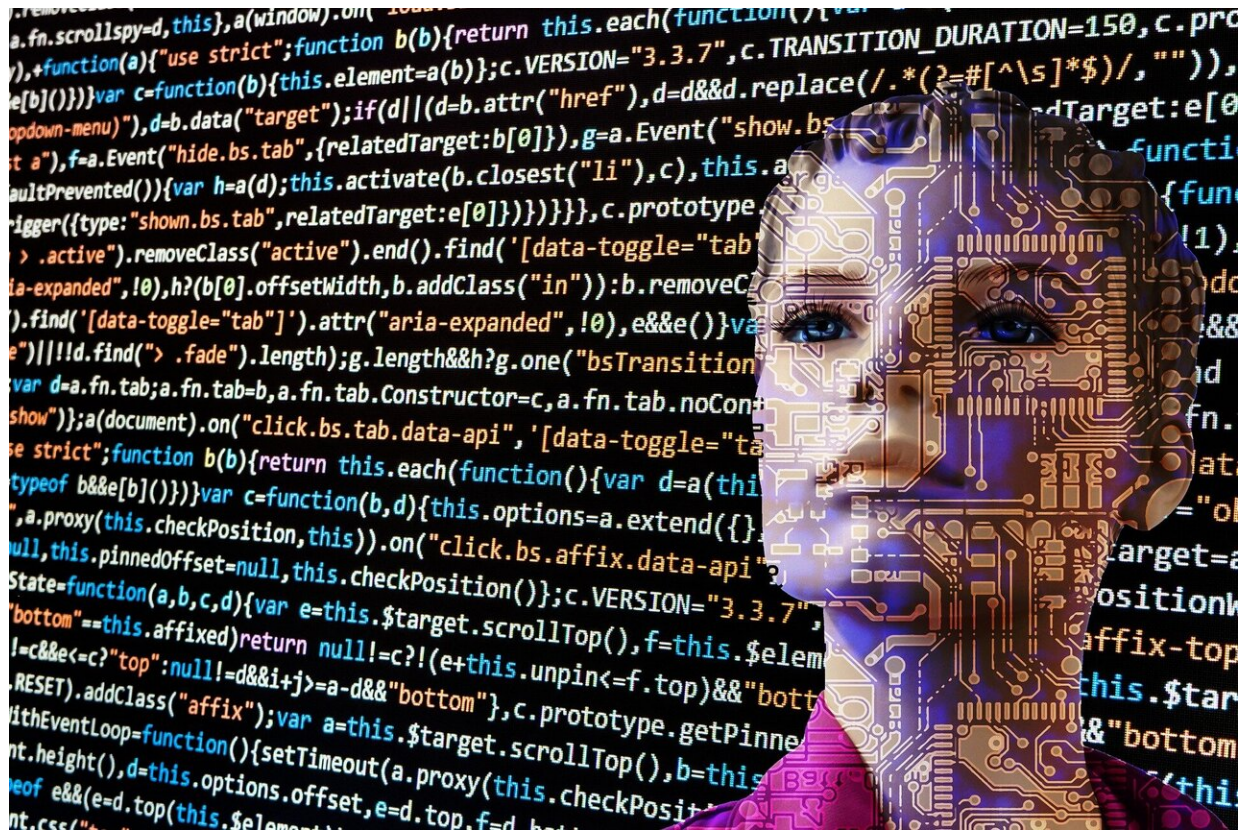# The potential of AI to improve cancer care is only going to grow

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Credit: CC0 Public Domain

Artificial intelligence (AI) has made a grand entrance into the public debate this year, but researchers have long been investigating its potential to transform cancer care and improve patient outcomes.

Dedicated sessions focused on AI will be held at the [ESMO Congress 2023](#) in Madrid, Spain, 20-24 October, to illustrate the strides being made with modern computing methods applied to oncology.

Amara's Law says that we tend to overestimate the impact of a technology in the short run and underestimate its effects in the long run. However, with any field dealing with human health, caution is warranted alongside enthusiasm and therefore, newer technologies like AI, machine learning, and [big data analytics](#) are introduced more slowly and more cautiously than in other sectors.

Examples of their application in [clinical practice](#) have so far been limited to the triage of biopsy images, mammograms, and lung computed tomography (CT) scans used to screen patients for tumors, and to some areas of [cancer](#) research. However, the implementation of these technologies into mainstream oncology research and practice has been far from uniform, signaling potential barriers that risk slowing its adoption and the benefits it could bring along the cancer research and care continuum including prevention, screening, and care pathways.

Harnessing the potential of AI to improve cancer detection

Building on a [qualitative study](#) presented at the ESMO Congress 2023 that explored the potential of AI-based technologies in improving cancer imaging, diagnosis, and delays in seven European countries, Dr. Raquel Perez-Lopez, a radiologist at the Vall d'Hebron Institute of Oncology in Barcelona, Spain, who was not involved in the study argues that existing, well-defined guidelines on cancer screening and diagnosis are not applied in the same way even within Europe, for reasons that may be both economic and cultural.

Perez-Lopez saw potential for emerging digital solutions to intervene upstream and prioritize patients for screening based on their [medical records](#).

"There are already AI-based platforms that allow the analysis of data routinely collected in electronic health records and medical imaging units, and which could support prevention and screening programs by identifying individuals at risk of developing the disease. But these resources remain underutilized," said Perez-Lopez, attributing this to the lack of an adequate legal framework for patient data to be used in this way.

Controlling AI to unleash real-world research

Perhaps less tangible, but equally important applications of modern computing methods are transforming certain areas of [cancer research](#). In the field of cancer genetics, for example, many of the mutations included in modern genomic reports used to match patients with targeted therapies were identified by AI tools comparing the genetic profiles of hundreds of thousands of patients and making predictions about their role in the development of cancer.

These technologies have also recently begun to be used more broadly to analyze various types of data in real-world evidence studies, which are gaining traction as a means of generating evidence in settings such as rare cancers, when traditional randomized clinical trials are not feasible, or to bridge the frequently observed gap between results achieved in clinical trials and real-world patient outcomes.

It is no coincidence that the recently published "ESMO Guidance for Reporting Oncology real-World evidence (GROW)", developed to guide scientific reporting in this field, also covers the subject of AI-based technologies.

In particular, the ESMO-GROW guidance aims to harmonize research practices in oncology by providing detailed recommendations for the testing and validation steps necessary to report real-world data accurately and transparently. Among these recommendations are included considerations related to the use of AI algorithms for data analysis in real-world evidence studies—an inclusion that is necessary to capture all the relevant oncology-specific considerations and anticipate future developments.

"In the near future, we could see AI tools transform data processing within hospital information systems and electronic health records by making it possible to structure physicians' free-text notes and summarize vast quantities of information at the press of a button, which will greatly facilitate the extraction of real-world data from medical records to generate new research insights," said Dr. Rodrigo Dienstmann, Editor-in-Chief of ESMO Real World Data and Digital Oncology journal, and Director of Oncoclínicas Precision Medicine, Sao Paulo, Brazil, explaining that the manuscript addresses this likely upcoming scenario in which the data used for research is no longer collected and structured by a human expert, but processed and summarized by a machine.

"Adopting a standard method to assess AI technologies with the same degree of reliability with which we can evaluate medicines in clinical trials will be key to maximizing their benefits, while ensuring that their adoption does not increase the risk of bias that could cause inequalities in patient care." Dienstmann emphasized.

Implementing digital oncology into practice

Real-world research powered by advanced data analytics is becoming increasingly ubiquitous as a complement to clinical trials, and is also beginning to spread within the regulatory agencies that use it in the authorization process of new medicines. Therefore, the ability to

accurately interpret this kind of evidence will be an essential skill for all oncology professionals in the future.

The [ESMO Real World Data and Digital Oncology journal](#) is a new open access, peer-reviewed platform dedicated to the publication of high-quality data science and education on the transformation of [cancer care](#) with real-world evidence and digital technologies.

According to Dienstmann, oncologists as a group are not ready for this evolution, with educational needs that will increase proportionally with the entry of AI into clinical workflows. "There is a lot of apprehension about the impact AI will have on the profession once machines outperform physicians in a number of their traditional repetitive tasks," he reported.

"We need to train doctors to use these tools wisely and confidently based on a clear understanding of their value and limitations, so that machines and humans together achieve better results for patients than either of them could on their own. ESMO Real World Data and Digital Oncology journal is a resource for physicians who will be confronted with the implementation of digital oncology in their routine practice."

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