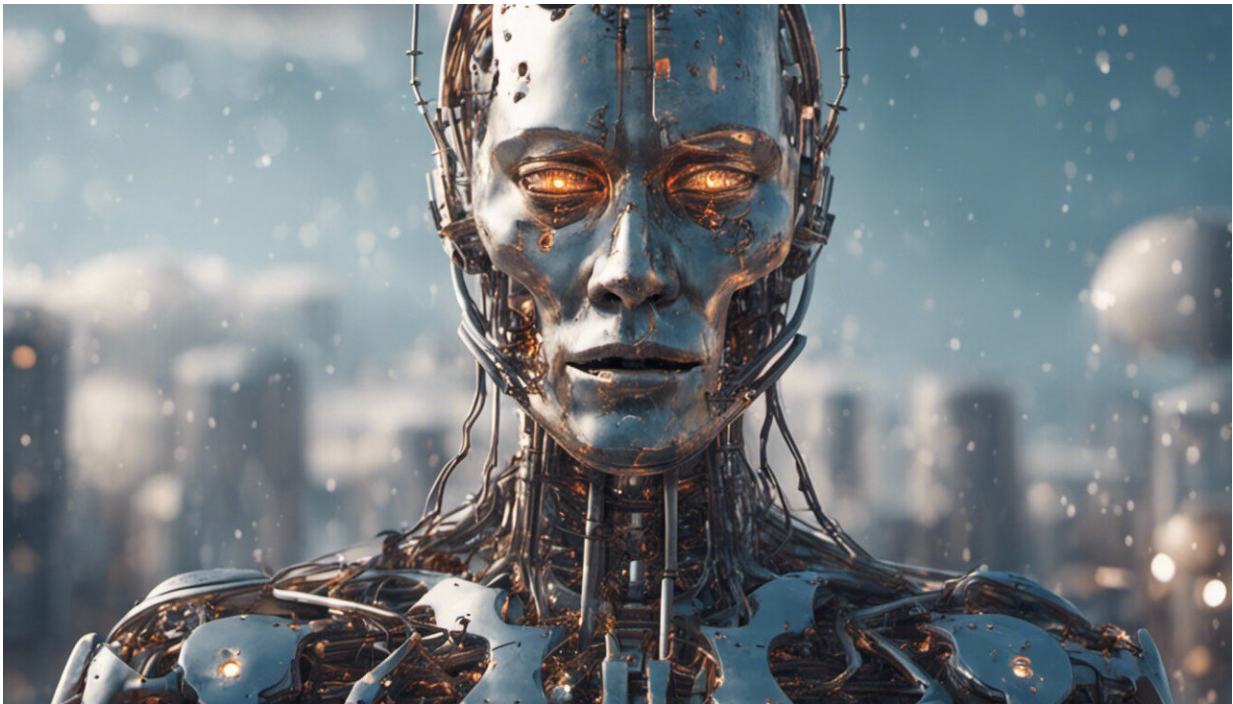


# AI is transforming medicine—but it can only work with proper sharing of data

January 9 2020, by Ara Darzi

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Credit: AI-generated image ([disclaimer](#))

It is not often that one witnesses a transformational advance in medicine. But the application of artificial intelligence (AI) to improve the early detection of disease is exactly that.

I was a co-author of the paper recently published in Nature showing that

an AI system developed by Google [was better at spotting breast tumors than doctors](#). Now, researchers in the US have reported that AI-supported laser scanners are [faster than doctors at detecting brain tumors](#). These are very exciting developments that will, ultimately, have a big impact on the accuracy, logistics and speed of diagnosis.

There are a multitude of similar projects underway that employ artificial intelligence in the [early detection of macular degeneration](#), acute kidney failure, skin cancer, sepsis, Alzheimer's disease and depression, [among others](#).

Healthcare provides especially fertile territory for these advances because of the sheer volume and complexity of medical knowledge. No clinician, however smart, can hope to master it. The aim is not to replace the doctor (yet, at least) but to enhance their medical expertise.

## **Saving lives, and costs**

As well as speeding up diagnosis and making it more accurate, potential savings of [around US\\$400 billion](#) in the US healthcare sector alone might be made from these developments, according to some estimates.

To achieve this, however, scientists need access to [data](#). Data is as vital to artificial intelligence as coal was to the railways and oil to the motorcar. To fulfill the promise of AI in healthcare, [medical data](#) will need to be treated as precious to our health as drinking water, says Etta Pisano, chief research officer at the American College of Radiology, [in a commentary](#) published alongside our paper in *Nature*.

It is a striking image: our global medical records may be as vital to our health as the water we drink and the air we breathe. And just as we seek to protect our drinking water from contamination and our air from pollution, we must protect our records from abuse. I know, as a

researcher, that [the risk is real](#) when it comes to keeping [patient records](#) confidential. And, as a patient, I know the safety of our data is paramount.

For our research on AI in breast cancer detection, we studied over 29,000 mammograms from women in the UK and the US. All the records were anonymized and no woman could be identified—a standard procedure to protect patient confidentiality. But the research could not have gone ahead without access to this vital data.

We need to demonstrate why [data sharing](#) is a social benefit, if we are to generate the growth that these innovations could deliver. There is a moral imperative to improve care for others through research. The biggest challenge, however, is to devise a system of data governance that protects the interests of patients, provides access for researchers, distributes the fruits of success fairly and wins the confidence of the public.

As set out in its [2017 industrial strategy](#), the UK government has established an Artificial Intelligence Council to boost growth of AI in the UK and its ethical use, and a Centre for Data Ethics to establish a governance regime for data driven technologies. This is a welcome recognition of the central importance of adopting an ethical approach to the development of these technologies.

But we need to go further. Public trust demands more transparency and the creation of incentives to allow data to be shared—for example, by giving the NHS a share of any commercial benefits gained from use of NHS data. There also needs to be a health-specific data charter, with clear rules, norms and standards, setting out what can be done, what should be done and what may not be done. The government should offer an absolute guarantee that patient information will not be shared outside the health, care and research systems. Users of NHS data should be

required to prove that they are using it to improve quality, safety and efficiency.

There are huge opportunities in these technologies to advance healthcare, benefit health systems and improve the outlook for millions of patients. But unless we establish clear rules from the outset, we risk sacrificing public trust, surrendering vital clinical gains and squandering the potential in the vast quantities of medical data we have spent decades accumulating.

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