

# The future of healthcare: AI changes everything

Accessing healthcare since the onset of the Covid-19 pandemic has primarily been a digital experience but this is just the start of a burgeoning revolution in our healthcare. The 'Future of Healthcare' will come under the microscope at the next virtual event in our [Invested in the Future series < http://www.sanlamfutureseries.co.uk/>](http://www.sanlamfutureseries.co.uk/) and in preparation, we look at some of the developing areas of AI in the healthcare industry.

Artificial intelligence (AI) has the power to transform the healthcare sector in a way that was unthinkable five or ten years ago – leading to healthy profits for investors in AI and a better life for us all.

“AI is an extraordinarily powerful tool – probably the most powerful tool we’ve ever had in our hands,” says Chris Ford, who runs the Sanlam Global Artificial Intelligence Fund with Tim Day.

“It’s going to transform people’s lives. It’s not just important because we want to make good money for our clients, but because we all want to know that our families will be looked after better and that we can afford the health outcomes we want. AI provides us with the best chance of doing that.”

Healthcare is a huge sector. It accounts for one-fifth of the US economy. It is also one of the world’s largest employers. In the UK, the NHS employs 1.3 million people, and on a typical day 835,000 people consult their GP or practice nurse.

“It’s massive,” says Ford. “It’s also very data rich, which is vital for the application of AI.”

In healthcare, and indeed other areas of the economy, AI typically does not replace humans but empowers them to do what they are best at while relieving them of more difficult or dull duties.

“AI is not going to replace doctors, but doctors who use AI are going to replace doctors who don’t,” says Day. “You could say the same thing of fund managers, lawyers or engineers.”

“As soon as companies start using AI effectively, they begin to innovate more rapidly in their business models. The efficiencies that AI brings and the insights it delivers to decision-makers are limited only by the creativity of the people within an organisation. As soon as you start to think differently, a lot of doors open for you.”

Many of AI’s applications in healthcare are underpinned by technologies that can be used to good effect elsewhere. For example, the fundamental principles used to identify tumours in medical imaging are the same as those used to recognise people’s faces for security or road signs in an automated driving platform.

“Healthcare is not anomalous in being addressable by these technologies but its specific characteristics – the very large proportion of GDP that it occupies, the huge amount of data that is produced in healthcare settings and the critical nature of healthcare where accuracy and timeliness are very important, particularly in diagnostics – create an environment in which AI is very helpful.”

The managers have identified and are capitalising on four key areas where AI is being harnessed in healthcare:

## 1. Diagnostics

Across healthcare, there is a shortage of skilled labour. In radiology, staff shortages are critical. Going into the pandemic, the NHS was already experiencing radiologist shortages of 27-37%. AI has the potential to solve that problem.

It is proven to be effective in medical imaging. A study in China showed a deep-learning inferencing tool to have greater than 85% accuracy in the identification of cancerous tumours, substantially higher than the accuracy of doctors at 65-75%.

“The AI takes seconds – almost the blink of an eye – versus your typical medical professional taking at least ten minutes,” says Ford. “And you need two people to do it.”

The reason for that is that one must check the diagnosis of the other. “The error rate is so high,” says Day. “It would be unacceptable to have 35% of all cancers being missed.”

By using AI for all medical imaging work and passing inconclusive cases to humans, accuracy is substantially increased.

The fund's play in this area is German medical-equipment maker **Siemens Healthineers**, which floated on the stock market in March 2018. Since then, its shares have risen 65%.

"You need a huge amount of data to train the AI in what to look for, and Healthineers has, at last count, 600 million medical images and its own supercomputing facility – that gives it a massive advantage," says Ford.

## 2. Drug discovery

Drug discovery has hitherto been highly costly and inefficient. The average drug takes a decade to develop and costs \$1.3 billion. The process of drug discovery has a 90% failure rate. "It's like throwing a plate of spaghetti at the wall and seeing what sticks," says Ford.

Broad application of AI in drug discovery promises to make the process far more efficient, from understanding the root cause of health conditions like Alzheimer's to the accurate identification of possible treatments and design of clinical trials.

**Alphabet**, owner of Google and AI offshoot DeepMind, is the largest position in the 38-stock portfolio. Last year, it made a "quantum leap forward" when its AlphaFold protein-folding modelling programme performed so well that it promises to rapidly accelerate efforts to predict the three-dimensional structure of a protein, enabling quicker and more targeted drug discovery.

"The DeepMind discovery was possibly the single most important thing that happened last year – people were so focused on Covid that they didn't notice," says Day. "It's like forgetting Galileo, Copernicus and Newton – it's that important.

"As soon as you can automate the process [of protein-structure prediction], and instead of doing it *in vitro* (in glass) you do it *in silico* (in silicone), you suddenly have the ability to do drug discovery work at scale. It has the potential to change everything about the way in which we are treated for the ailments we develop and ultimately how we lead our lives."

## 3. Treatment

Patients are demanding AI in areas like robotic surgery. Telemedicine techniques create the prospect of highly trained surgeons in London or New York operating on patients thousands of miles away.

Among the fund's top ten holdings is **Intuitive Surgical**. "Its advantage is that it was there first," says Ford. "It has carried out the most procedures, and therefore it has the most data. And it is able to innovate in its systems around the analytics of that data to the extent that it now has very sophisticated training modules for surgeons and proper benchmarks."

Another holding is **Dexcom**, a developer of continuous glucose-monitoring systems for diabetes management. The eventual aim is to create an artificial pancreas by linking its sensor to an insulin pump.

That stands to bring medical treatment into what many might see as a futuristic world. "Most people think that the idea of having an electronic device implanted in your body is the stuff of science fiction, yet you have a large clinical population for whom this is becoming entirely normal," says Day.

## 4. Administration

The US is transitioning from a fee-for-service to a value-based reimbursement model. Alongside patients, health insurers across the Atlantic are also driving change.

"Insurers are now on the hook for the cost of the procedure and delivering an outcome whereas before they would get paid a set fee regardless," says Ford.

The fund owns **UnitedHealth Group**, the largest healthcare provider in the US, which is using AI in several ways, an example being more efficient billing and coding.

Despite the myriad applications and benefits, AI remains in its infancy in terms of what it has achieved so far in the healthcare sector. That said, its development and application is moving at pace.

For the managers of the Sanlam Global Artificial Intelligence Fund, the case for investing in AI is not just about

making money. It is also about financing and supporting nexuses of technology that will transform the way in which people will lead their lives, not just in the western world but in developing countries too.

“It changes so much,” says Day. “It changes the control of your own body and your own health. It goes from a situation where you are subject to the opinion of a doctor, who is very regularly wrong and, in any case, the information is delivered at the wrong moment (usually too late), to a situation where data is delivered into your hands.

“It’s the ultimate example of habeas corpus – you are finally going to be in a position to take control of your biological destiny. It’s going to take a long time to get there because the body is so complex, but why would you not want exposure to this? It is going to change everything.”

The ‘Future of Healthcare’ with Rosemary Leonard, a practising GP, TV doctor and well known healthcare journalist, will take place on Thursday 3 June from 11am to 12pm. To register or find out more about our ‘Invested in the Future’ series visit our **dedicated microsite**. < <http://www.sanlamfutureseries.co.uk/>>