

AI and technology: The symbol of modern medicine

How can the current problems in healthcare be minimised using AI and technology?

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AI and technology: The symbol of modern medicine

As a post-millennial, it is difficult to remember a time when technology and computers did not exist and it is apparent that technology has shaped my life and society to be what it is today. The constantly advancing and evolving nature of artificial intelligence and technology means that it is inevitable that it will continue to define and drastically transform our lives across many spheres and one sector we cannot ignore is its implementation in medicine and healthcare. With AI and technology, we have the potential to solve numerous dilemmas in current healthcare, from diagnosis and treatment of high incident diseases to improving healthcare administration and universal health coverage.

-The issue of a reactive medical system-

During my summer break, I was exposed to the healthcare in Sri Lanka. While spending time in overcrowded waiting rooms in surgeries, seeing children sharing beds and cots in the paediatric ward and the limited facilities gave me food for thought in comparing and contrasting the health services there and in the UK. I started to reflect a bit deeper and began to question what creates this detrimental difference of quality of care. Is it the fact that there are fewer doctors? Is the training not efficient? Is there a lack of investment in the right sectors? It is recognised that there isn't a sole reason for the difference in global healthcare but a combination of various factors; however, it does all boil down to the country's healthcare framework.

Currently, healthcare systems can be categorised into two; reactive and proactive. A reactive medical system is where a patient becomes ill and then the doctor reacts to the symptoms using given clinical knowledge (1). In other words, we essentially wait for the heart attack, stroke or cancer to occur or be noticed before taking action, making this a flawed system which is slow and expensive.

-Moving to a predictive and proactive medical system-

In NHS England a national survey found that over 40% of people want to be more involved in the decisions made about their health and care (2). This is a significant issue as one of GMC's guidelines of good medical practice includes 'respect[ing] the rights of patients to be fully involved in decisions about their care' (3). The solution to this can lie within the realms of AI and technology. For example, the creation and wider use of health apps which closely monitor what a person eats, their movement and what a person does or feels in a day produces continuous data for a person. AI can then detect risk factors and early symptoms for that person and can recommend certain steps for them to do to. For example, instructions to lower their risk of developing an illness or for them to visit a doctor.

In addition, this means that patients will have a larger data set which medical professionals can use, aiding for more precise and quicker decisions to take place based on the patient's data rather than generalised clinical knowledge. Doctors can create the right treatment plan suited specifically for the patient. It can also be extremely useful for producing quality medical research with more valid, reliable and generalisable results and conclusions, thus driving medical research to its optimum.

At times it is forgotten that technology isn't always computers and smart devices clustered with screens. As suggested by Daniel Kraft in a TEDxBerlin talk, toothbrushes and toothpaste could have the possibility to monitor and detect antibody or bacterial levels which in turn can predict viral infections preventing the spread of the disease (Kraft 2014)(4).

I now understand what David Cutler meant when he wrote: 'The single most underused person in health care is the patient' in an MIT Technology Review (5). By simply empowering patients to be in control and take initiative over their health through the aid of AI enhances the future of person-centred health which allows predictive medicine and autonomous healthcare to develop and foster.

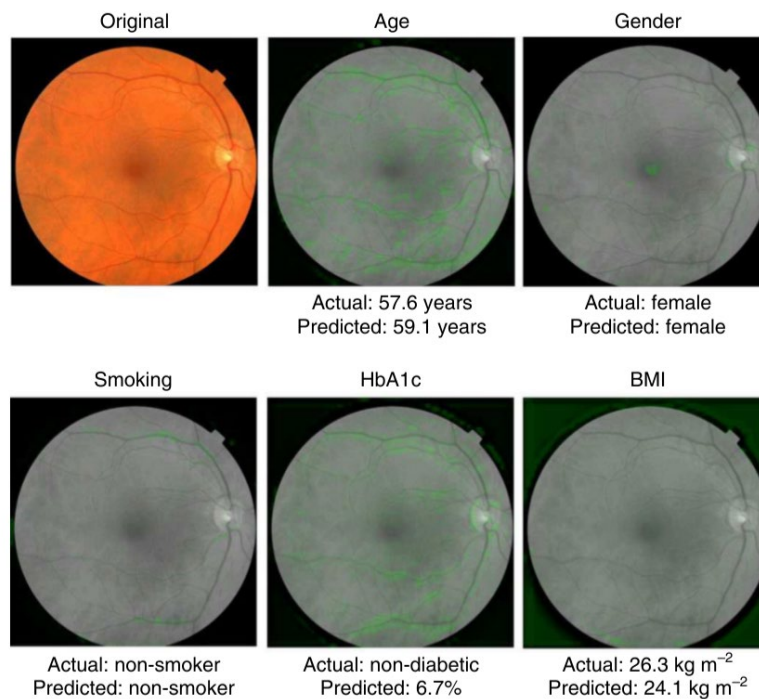
-The concerning incidence of cardiovascular disease-

Heart-related diseases have been the leading cause of death worldwide for the past 15 years. Specifically, Coronary heart disease, the number 1 cause of death, and chronic obstructive pulmonary disease, the third leading cause of death, combined killed 12.5 million people in 2016 which has increased by 14.5% from 2006 (6). The incidence of these diseases are estimated to increase due to rapid economic transformation leading to environmental changes and unhealthy lifestyles as well as population ageing relating to more risk factors (7).

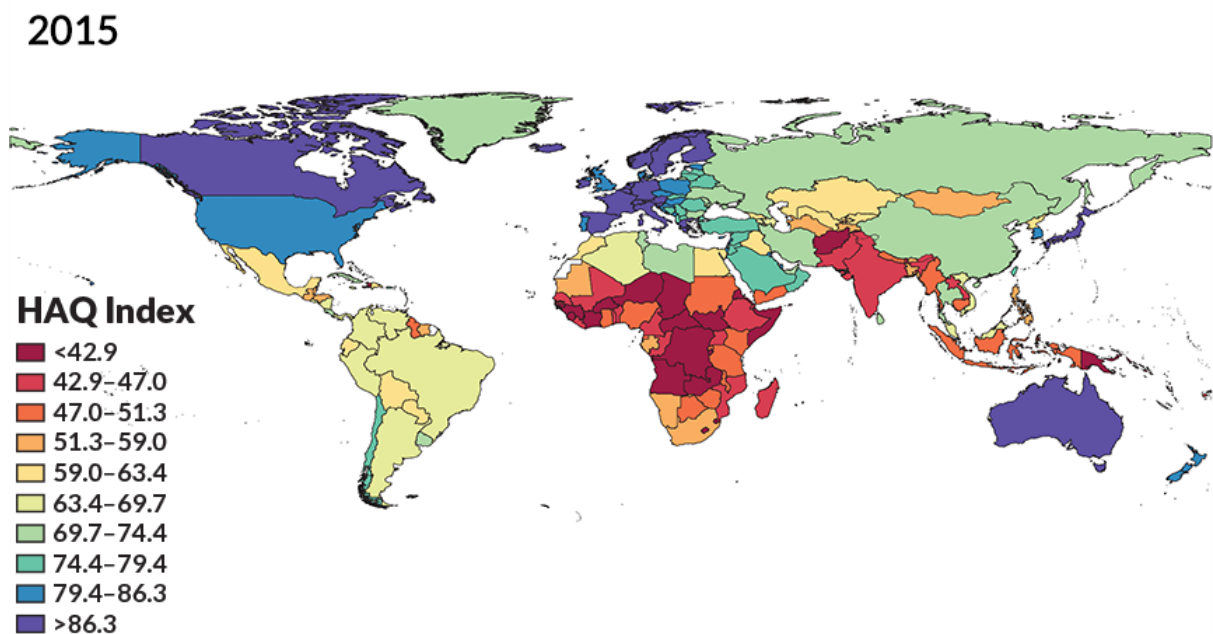
It is evident that treating heart-related diseases are a massive problem in healthcare, therefore improving diagnosis and treatment is extremely necessary.

Case Study: Eyes are the window for heart health

In 2018 Verily and Google AI teamed to develop AI which could diagnose cardiovascular disease by a single eye scan that could predict your risk of developing the disease in the next 5 years through identifying age, sex, smoking status, A1C, BMI and blood pressure.



The research found that AI was 70% accurate, which is 2% less than the current method of using blood tests, however, it is a very promising start. With more development the percentage has the potential to increase, offering a cheaper, quicker and more accessible diagnosis tool which can speed up medical analysis (8).



-The global disparity of quality healthcare-

The application of AI and technology in medicine can make Universal Health Coverage become a reality. The use of AI such as in smartphones to take blood tests and urine samples and immediately diagnose a patient is a massive step in areas where access to hospitals and clinics are very difficult so diagnosis could take weeks or even months as samples are tested in labs in larger cities.

Giving access to devices which can diagnose illnesses or flag up risk factors of symptoms can lead to earlier predictions, or diagnosis thus leading to earlier intervention and treatment, decreasing death rates by thousands. This highlights how essential the role of technology is in places where many of the population haven't even visited a doctor once due to socio-economic reasons.

Healthcare quality and access in 2015. (9)

AI and technology also have the potential to converge satellite imaging data and illness population data to map where illnesses or diseases are more prominent in and then calculate the percentages of medical specialists needed in a given area. This allows the demand for healthcare to be met accordingly and paves the way for a more citizen-centric healthcare system which is quality and value-driven.

Conclusion

It is clear that the implementation of AI and technology in healthcare will have a multiplier influence of benefits, ranging from earlier diagnosis and intervention; more precise treatment; providing new ways to capture health information; restoring time, compassion and communication between patients and doctors to revamping how we administrate healthcare. AI holds the key to minimising or solving these issues in healthcare and as humans, all we need to do is dare to place the key in the lock and unlock it.

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