

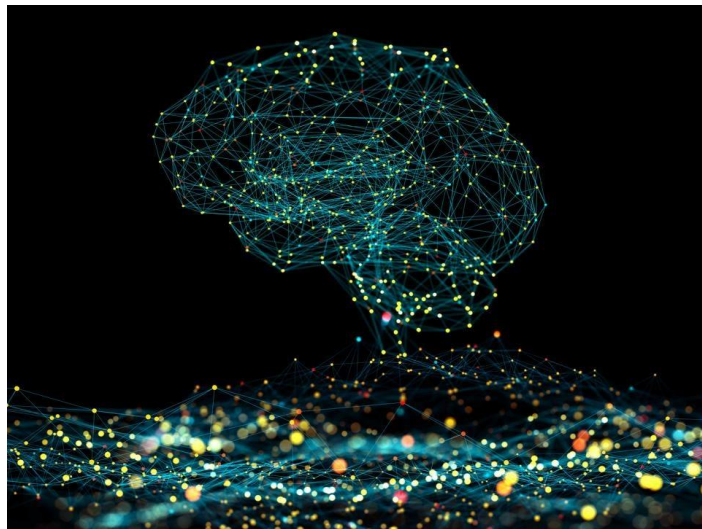


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Academic report

AI in Healthcare - with a focus on SDGs and Ethics



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Title

AI in Healthcare with a focus on SDGs and ethics

Abstract

This report focuses on the role of Artificial Intelligence (AI) in Healthcare. The report also takes into consideration its impacts on Sustainable Development Goals (SDGs). This report also addresses the Ethical concerns raised by Artificial Intelligence (AI) involvement in Healthcare.

Keywords

Artificial Intelligence (AI), Role of AI, Healthcare, Sustainable Development Goals (SDGs), Ethics

Content

1 Introduction.....	4
<i>1.1 Background/idea</i>	<i>4</i>
<i>1.2 Purpose</i>	<i>4</i>
<i>1.3 Scope</i>	<i>4</i>
<i>1.4 Method</i>	<i>4</i>
2 AI in healthcare	4
<i>2.1 An overview.....</i>	<i>4</i>
<i>2.2 AI Application in Healthcare</i>	<i>5</i>
3 Impact on Sustainable Development Goals	6
4 Ethical considerations in AI Healthcare	7
5 Future trends and Innovations	8
6 Conclusion.....	8
7 References :.....	9

1 Introduction

1.1 Background/idea

When it comes to healthcare, it revolves around Humans and any error can majorly impact the quality of life. It's interesting to see the role of AI in healthcare. AI is evolving rapidly every day.

1.2 Purpose

Purpose of the report:

- How AI may solve our health problems?
- How involvement of AI in healthcare can help us in achieving SDGs?
- Ethical considerations raised from AI involvement in healthcare.

1.3 Scope

This report aims to provide a relationship between AI and Healthcare with relevance to SDGs and Ethics.

1.4 Method

The methodology used for this report relies on information gathered from various online articles and books. The selection of the sources is made on the basis of their relevance to the subject and reliability.

2 AI in healthcare

2.1 An overview

In healthcare, AI refers to the use of computer algorithms and machine learning techniques to analyze and interpret medical data, assist in diagnostics, develop treatment plans, and improve patient care. [\[1\]](#)

Currently, AI is used in various ways in Healthcare systems. For instance, AI is widely used in radiology for image analysis, cardiology for EKG interpretation etc. AI chatbots are assisting patients, devices are used for continuous health monitoring and many more ways. AI has helped in reducing the administrative

task for doctors and nurses, resulting in more time to doctors & nurses for patients.

2.2 AI Application in Healthcare

Real world examples of AI in healthcare involves:

- 1) Artificial Intelligence assistance in “keeping well” – It’s helping people in staying healthy by guiding them towards healthy lifestyle. For instance, healthcare apps, smart watches etc. encourage healthy behaviour among individuals.
- 2) AI-assisted robotic surgery – AI enabled robots acts as a helper and can perform basic acts of precision cutting & stitching. For instance, Lasik eye surgery, Focused ultrasound etc. In these surgeries, surgeon controls the robotic suturing. In 2017, surgeons using AI assisted robotics to suture extremely narrow blood vessels –.03 to .08 millimetres across– at the Maastricht University Medical Centre, Netherlands. [\[2\]](#)
- 3) Clinical judgement or diagnosis – AI plays an important role in supporting clinical judgement. For instance, medical images like X-rays, MRI’s, CT scans etc. provide reports and help in accurate diagnosis of medical condition. It helps Healthcare professionals in making effective and efficient decisions for the utmost well-being of their patients.
- 4) Precision medicine- AI is used for patient monitoring. It is used to keep track of patient statistics, health history, continuous monitoring of critical patients etc. In turn, which helps Doctors to provide the precise treatment based on that particular patient health history. For instance, wearable devices equipped with sensors collect data. “IBM Watson and Google DeepMind are leaders in mining medical records.” [\[2\]](#)
- 5) Drug discovery – AI potential in Drug Discovery is remarkable. Analyzing the large amount of data is so much easier now, resulting in quick analysis. It also helps in detecting patterns in the data which is needed for large clinical studies.

Based on the data, potential disease outbreaks can be predicted. Thus, drugs can be discovered beforehand.

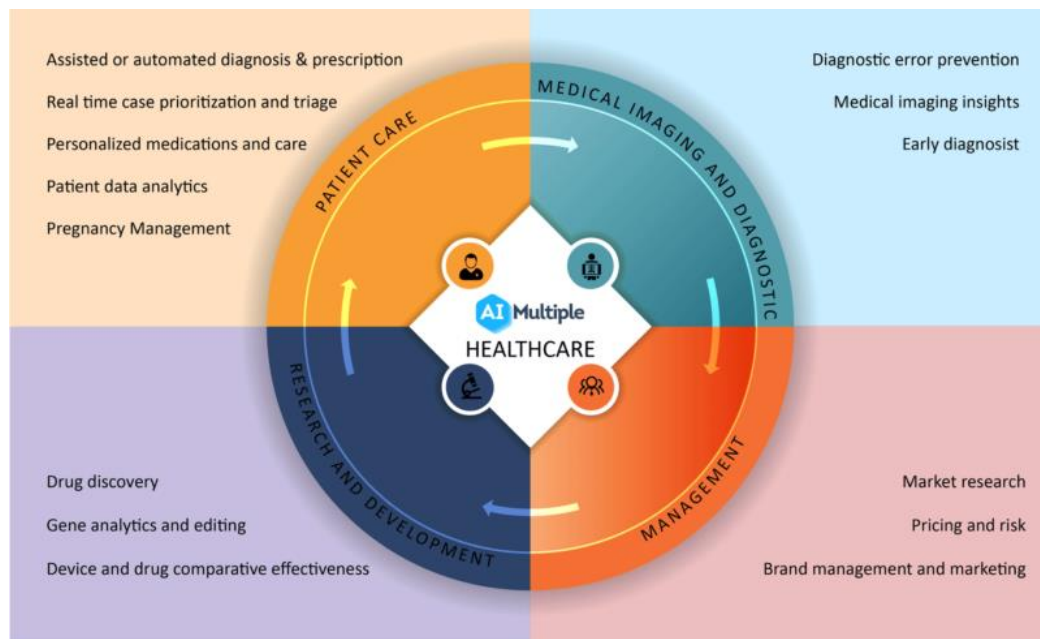


Fig 1: Illustrative picture of AI application in healthcare [3]

3 Impact on Sustainable Development Goals

Artificial Intelligence (AI) in healthcare contribute significantly towards several Sustainable Development Goals (SDGs) [4].

- **Good Health and Well-being (SDG 3) [4]** : AI aids in Precise diagnosis, personalized treatment, predictions for the potential breakdown for new diseases, forecasting of diseases based on citizen segmentation, virtual patient monitoring etc. and can directly resonate with Good Health and Well-being.
- **Quality Education (SDG 4) [4]**: AI enhances medical education & training. It provides easy access to large amount of valuable data which is very useful for Healthcare professionals and students in getting quality education.
- **Industry, Innovation and Infrastructure (SDG 9) [4]**: AI drives innovation in Healthcare via new drugs discovery, development on new treatments, development of new technologies, optimization of resources and reducing infrastructure cost.

- Reduce Inequalities (SDG 10) [4]: Provide access to expert medical advice in remote areas. It also helps in reducing the cost for medical facilities resulting in equal access to medical facilities regardless of socio-economic status.
- Partnerships for the Goals (SDG 17) [4]: Promotes worldwide collaboration, empowering sharing of best practices, treatments, knowledge in healthcare.

4 Ethical considerations in AI Healthcare

Ethical considerations	Legal considerations related to ethical aspects
1. Informed Consent to use	Liability
2. Safety and Transparency	Safety and effectiveness, Cybersecurity
3. Algorithms fairness and biases	Intellectual property law
4. Data Privacy	Data protection and privacy

Table 1: Overview of Ethical considerations [5]

- Informed consent to Use: Patients should be well-informed about AI use in diagnosis, treatment or decision making.
- Safety and Transparency: It is of utmost importance when it comes to AI in healthcare. Below example clarifies very well the importance of the same:

“IBM Watson for Oncology come under criticism by reportedly giving “unsafe and incorrect” recommendations for cancer treatments. The problem seems to be in the training of Watson: instead of using real patient data, the software was only trained with a few “synthetic” cancer cases, meaning they were devised by doctors at the Memorial Sloan Kettering (MSK) Cancer Centre.” [5]

- Fairness and Biases: It is also important to ensure that data used for training algorithms is fair and unbiased. For example, data collected for skin cancer can vary based on ethnicity, weather, geographic locations etc. resulting in inaccurate treatments.
- Data Privacy: Data generated through patients is the core ingredient for the development of algorithms for AI. It is primarily important to effectively

inform patients about management of their data. “Dinerstein v. Google and *Project Nightingale* by Google and Ascension are recent case studies showing patient privacy concerns in the context of data sharing and the use of AI.” [5]

5 Future trends and Innovations

“AI is like a baby who learns something new every day. It is similar to the way the human brain learns by processing information in a network of cells. Nobody explains to program in his lab how to behave in order to interpret the photos instead it learns on its own.” says Max Gordon, Danderyd Hospital. [6]

AI is evolving, futuristic Healthcare seems to be a doctor identifying diseases and accessing patients who are not human. Medical diagnosis by AI is under research.

Facts: 3 famous AI:s to take into account

Watson is a computer system created by IBM. Originally developed to answer questions on the quiz show Jeopardy!, it is currently pursuing a medical career. Its duties will include making cancer diagnoses and helping out where there is a shortage of doctors in India.

Fig 2: Futuristic AI in healthcare [6]

6 Conclusion

AI in Healthcare can bring tremendous improvement in the quality of life. However, it can also raise many concerns for society. While writing and researching for the report, I realized that till now AI can solve limited tasks. Futuristic AI shows great potential. I would like to conclude with Mahatma Gandhi quote:

“Whatever you do for me but without me, you do against me.”

There should be guiding principles enforced globally for responsible and trustworthy approach to AI. These principles should be based on Fairness, Reliability, Security, Inclusiveness, Transparency, Accountability and Safety.

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