Artificial Intelligence

Artificial intelligence (AI), the ability of a computer system to perform tasks commonly associated with intelligent beings.
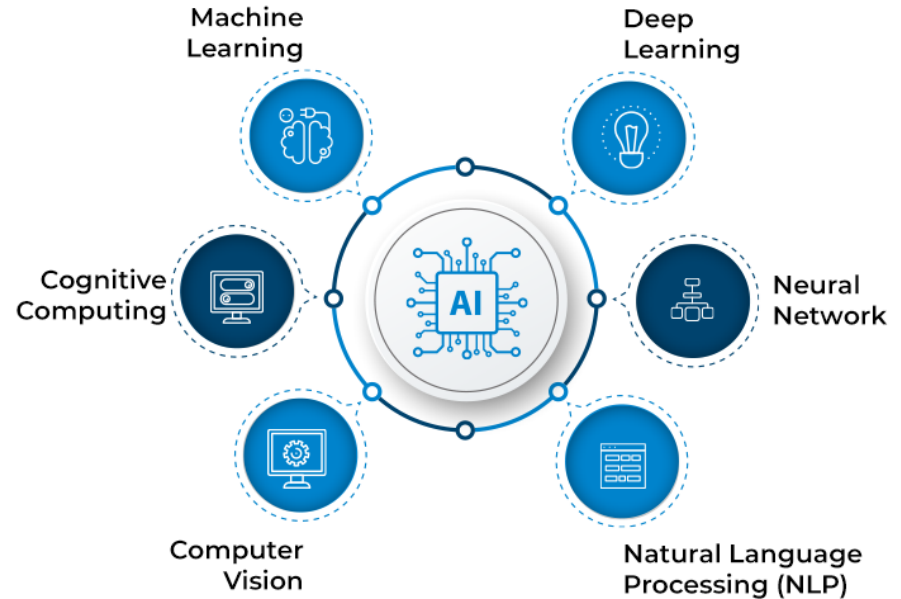
AI in Healthcare
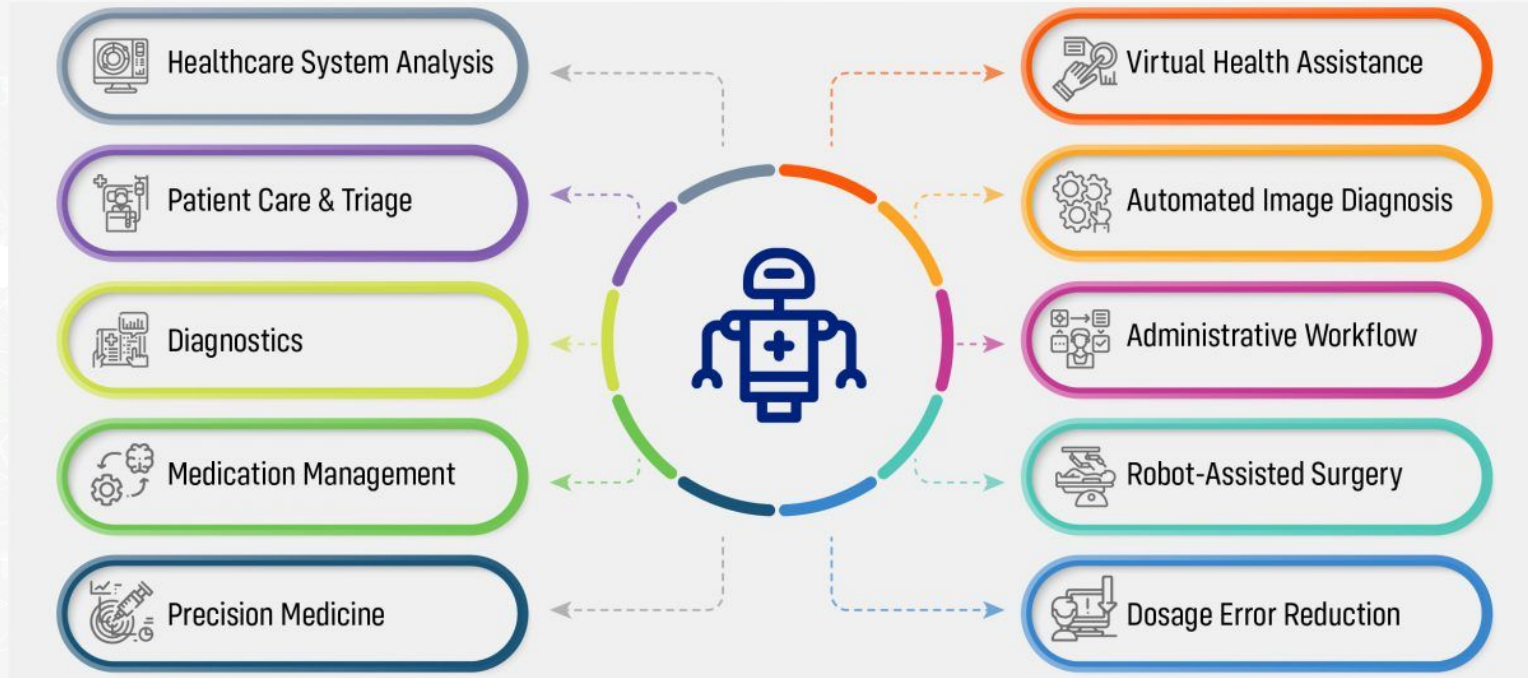
Challenges to Successful AI Implementation in Healthcare

- Ethical & Legal Issues for Data Sharing

- Training Healthcare Practitioners and Patients to Operate Complex AI Models

- Managing Strategic Change to Put AI Innovations into Practice

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Research Ethics

- **Ethics** is a sub-branch of applied philosophy that seeks to determine "*what is right and wrong right, the good and the bad set of behaviors in a given circumstance*"

- **Research ethics** is a branch of applied ethics that has well established rules and guidelines that define their conduct.

- The first and the foremost responsibility of the researcher is to take care of the safety, dignity, rights, and well-being of the participants. Researchers have to take care of various issues at different stages of research process.

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Data Protection

It refers to the technical and legal framework designed to ensure that personal data is safe from unforeseen, unintended or malevolent use.

Lawful and fair

Collected for a specified, explicit and legitimate purpose

Appropriate security

GDPR Principles for Law Enforcement

Adequate, relevant and not excessive

Held no longer than necessary

Accurate

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Problem

- Machine learning practitioners who develop ML solutions may not be adequately equipped to identify potential ethical and data protection challenges during the development of ML algorithm, testing and deployment process.

- On the other hand, ethics review committee members drawn from the medical field who are meant to review the pilot/testing and eventual use of the systems lack sufficient, if any, understanding of AI/ML.

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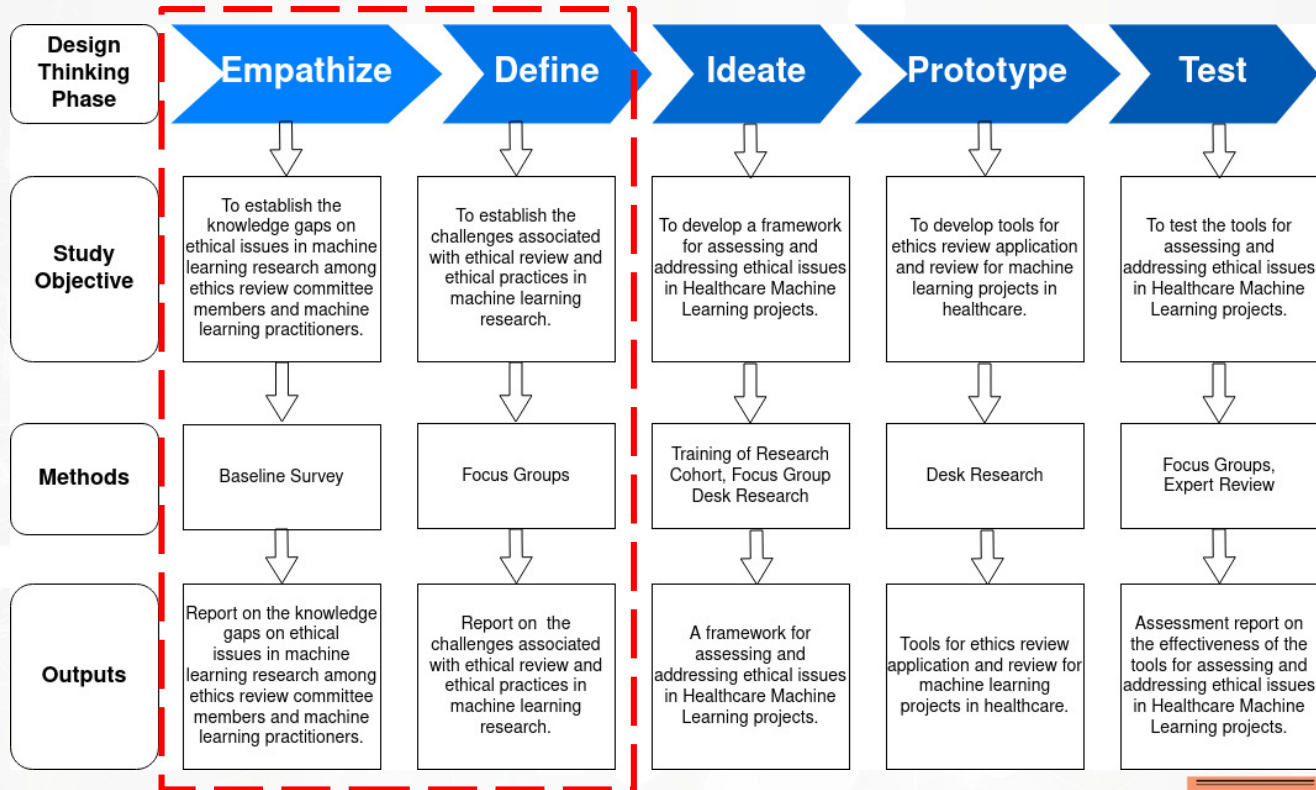JOURNAL

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Study Objectives

To establish the knowledge gaps on ethical and data protection issues in machine learning research among ethics review committee members and machine learning practitioners.
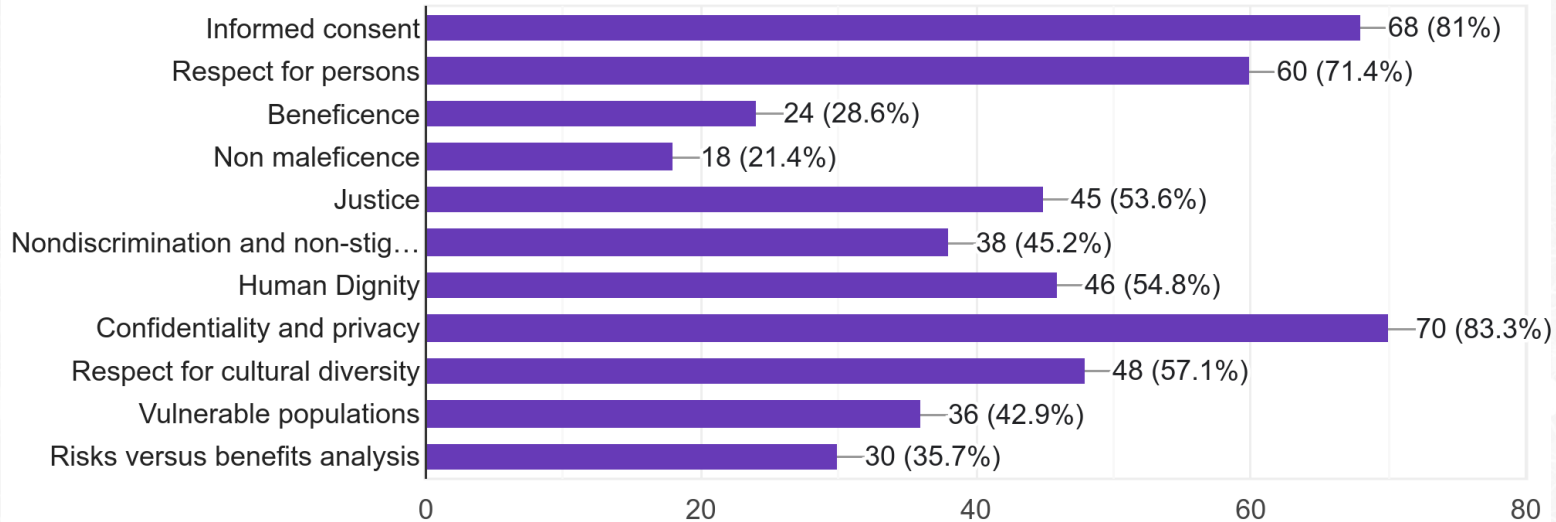
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Methodology

Design Thinking Phase	Empathize	Define	Ideate	Prototype	Test
Study Objective	To establish the knowledge gaps on ethical issues in machine learning research among ethics review committee members and machine learning practitioners.	To establish the challenges associated with ethical review and ethical practices in machine learning research.	To develop a framework for assessing and addressing ethical issues in Healthcare Machine Learning projects.	To develop tools for ethics review application and review for machine learning projects in healthcare.	To test the tools for assessing and addressing ethical issues in Healthcare Machine Learning projects.
Methods	Baseline Survey	Focus Groups	Training of Research Cohort, Focus Group Desk Research	Desk Research	Focus Groups, Expert Review
Outputs	Report on the knowledge gaps on ethical issues in machine learning research among ethics review committee members and machine learning practitioners.	Report on the challenges associated with ethical review and ethical practices in machine learning research.	A framework for assessing and addressing ethical issues in Healthcare Machine Learning projects.	Tools for ethics review application and review for machine learning projects in healthcare.	Assessment report on the effectiveness of the tools for assessing and addressing ethical issues in Healthcare Machine Learning projects.

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Results – AI Researchers & Practitioners

Prior to this survey, which of the following terms related ethics were you aware of?

84 responses
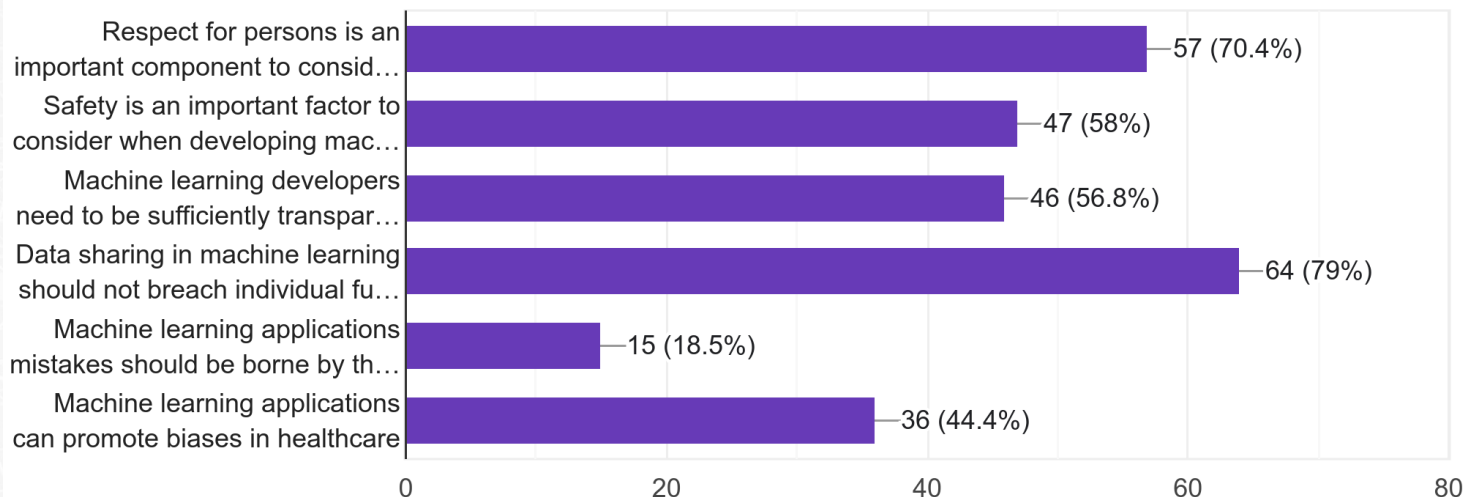

- Informed consent — 68 (81%)
- Respect for persons — 60 (71.4%)
- Beneficence — 24 (28.6%)
- Non maleficence — 18 (21.4%)
- Justice — 45 (53.6%)
- Nondiscrimination and non-stig… — 38 (45.2%)
- Human Dignity — 46 (54.8%)
- Confidentiality and privacy — 70 (83.3%)
- Respect for cultural diversity — 48 (57.1%)
- Vulnerable populations — 36 (42.9%)
- Risks versus benefits analysis — 30 (35.7%)

Results – AI Researchers & Practitioners

Prior to this survey, which of the following issues regarding the principles of bioethics were you aware of?
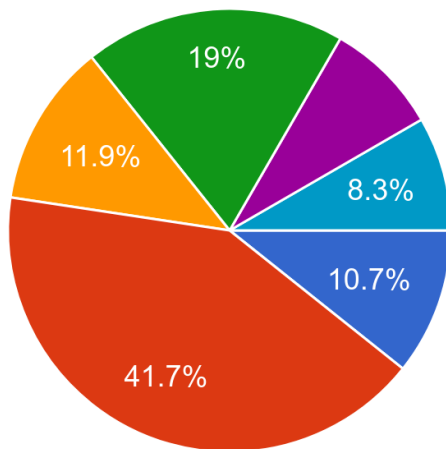
81 responses

Results – AI Researchers & Practitioners

Data Protection Laws

84 responses

Pie chart legend:
- I have not heard about the Data Protection Laws in my country
- I have heard about the Data Protection laws but I have not read them
- I have read the Data Protection laws
- I have heard about the Kenya Data Protection Act 2019 but I have not rea…
- I have read the Kenya Data Protection Act 2019
- I have not heard about the Kenya Dat…

Pie chart values: 19%, 8.3%, 11.9%, 10.7%, 41.7%

Results – Ethics Committee Members

Level of AI knowledge

- *"So I prefer the artificial intelligence to work with because you can do much within a short time"*

- *"getting machines to actually do what we do, what human beings do "*

- *"systems that would try to mimic or emulate what we would do as human beings. Either from a cognitive perspective or from a kind of psychomotor use of physical capabilities that we have as human beings "*

- *"the ability of a computer to think like a human being and process things like a human being and actually replace the human aspects of doing things"*

- *"The way we normally think, the way we normally do our transaction businesses. How we run a statistical analysis. We can use machines to help us in doing those analyses in a faster, efficient way."*

- *"to use machines to do what human would have done using their own intelligence"*

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Results – Ethics Committee Members

Review of AI Research Proposals

- *"the protocols that we have looked at, none of them have involved artificial intelligence."*

- *"I have sat in cases where students present proposals or projects that have got AI components and have got machine learning components, "*

- *"the proposals or protocols that meet the criteria of an artificial intelligence. It's mostly own statistical aspects like database analysis, whereby some investigators are trying to interrogate how to control maybe systematic biases or 1to predict certain models in a way"*

- *"we are privileged to have received, not so many, but at least two of artificial intelligence related kind of protocol"*

- *"we have not been able to review such a protocol."*

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Results – Ethics Committee Members

Review of IT Research Proposals

- *"they are very minimal. Currently this year, we haven't received any."*

- *most of the protocols that we receive on our end are basically topics that touch on human issues. Mostly, those are the ones we receive not from these other areas like I.T., we rarely receive such like protocols.*

- *"So it is not actually from IT or our computer science students. It is mostly from the statistics and applied statistics students."*

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Results – Ethics Committee Members

Data Protection Act 2019 – Awareness

- *"I have heard about the data protection act and I must say that we are privileged to at least initiated a training on the data protection act. "*

- *" I'm aware about the Data Protection Act and. We have been trained "*

- *"I have, of course, heard about the act, but I will admit I have not had any real training in it's application and so on. And I would really wish I could be trained."*

- *"'I've heard about it but we've never had any training."*

- *"I have heard about the act, I've read about it but I think we still need to have some training so that we can connect It's application, especially when it comes to review of protocols"*

Results – Ethics Committee Members

Data Protection Act 2019 – Impact

- *"this has enabled me to do is actually when I'm looking at postgraduate student proposals, then, the principles, the data protection principles can become very important. And then the custody and the disposal of the data collected becomes very key to handle."*

- *"it's really going to change the way we handle data generally right from the time we are collecting that data, the way we process that data, are we process it within the restrictions of the law and more importantly, how we keep that data."*

- *"the review of the protocols, the IRECs then have to be much more diligent and much more strict, and then they have to develop new forms to be filled,"*

- *"this is more of a boardroom thing. There's no systems in place for monitoring the violations of the protection of data."*

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Discussion

AI Researchers and Practitioners

- A majority do not submit proposals for ethics review … it is not thought of as necessary.

- A majority are not aware of, or have not read data protection laws … they are therefore not aware of its implications for their work.

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Discussion

Ethics Review Committee Members

- There is low level of awareness of AI / ML … a majority of members are from the medical and social sciences.

- There is a low level of awareness of the data protection act and its implications on review of proposals … there is no training so far on this.

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Conclusions

- There is need for AI / ML practitioners and researchers to be trained on research ethics and data protection in their context.

- There is need for ethics review committee members to be trained on the basics of AI / ML and data protection in the context of AI.

- There is need for a custom review process and tools for ethical review of AI / ML research projects.

Future Work

- To develop a framework for assessing and addressing ethical issues in Healthcare Machine Learning projects.

- To develop tools for application and review of ethical and data protection issues in machine learning projects in healthcare.

- To test the tools for assessing and addressing ethical issues in Healthcare Machine Learning projects.

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