Whose Data, Whose Ethics?
A Normative and Empirical Inquiry into Use of Patient Data for the Development of AI in Radiology

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Background

Artificial intelligence (AI) in radiology depends on large imaging datasets – 'big data' (1) for algorithm development and validation. This raises important ethical concerns regarding patient consent, privacy, data ownership, algorithmic bias, accountability, and equitable benefit sharing. International radiology bodies including the European Society of Radiology (2), Royal Australian and New Zealand College of Radiologists (3), and Royal College of Radiologists (4) have emphasized the need for ethical stewardship in the use of imaging big data. However, the perspectives of stakeholders, including radiologists and radiographers—particularly in South Asia—remain underexplored. This study combines quantitative assessment of stakeholder attitudes toward core data ethics with a multi-theoretical normative analysis using Principlism, Deontology, Utilitarianism, Virtue Ethics, and Islamic Ethics to better understand how ethical principles can guide responsible AI implementation in radiology.

Objectives

- Assess awareness and key ethical concerns regarding the use of big data for AI development in radiology
- Integrate the findings with normative ethical analysis

Materials and Methods

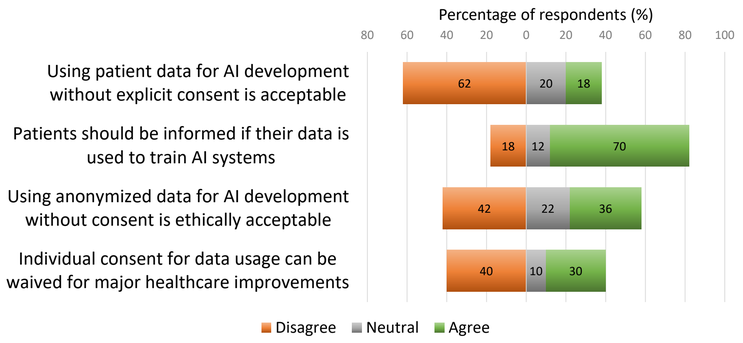
Following Ethical Review Board approval, a quantitative cross-sectional survey using 12 Likert-scale questions was conducted among radiologists, residents, radiographers, and departmental managers. Responses were analyzed using descriptive statistics and interpreted through a normative ethical framework including Principlism, Deontology, Utilitarianism, Virtue Ethics, and Islamic ethics (Maqāṣid).

Normative ethical frameworks, principles and application to data usage for AI

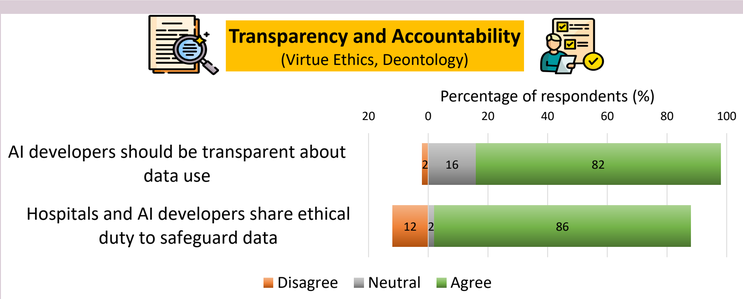
Framework	Core Principal	Application to AI data usage
Principlism (5)	Balances autonomy, beneficence, non-maleficence, and justice	Balances consent and privacy vs public benefit, fairness, and ownership
Deontology (6)	An action is ethical if it is universalizable and individuals are treated as ends in themselves, not merely as means	Supports consent and respect for patient dignity, tensions in secondary data use without explicit consent risking use of patients merely as a means
Utilitarianism (7)	Prioritizes actions that produce the greatest overall benefit for the largest number	Justifies data reuse if healthcare benefit outweighs individual risk, conflicts arise if benefits come at the cost of privacy, discrimination, or harm to individual patients
Virtue ethics (8)	Emphasizes moral character, professional integrity, and trustworthiness	Accepts usage guided by honesty, prudence, and patient welfare, unethical when driven by profit, poor stewardship, or neglect of privacy and confidentiality
Islamic ethics(9) (Maqāṣid)	Prioritizes protection of life, dignity, intellect, justice, and public welfare	Permits use for *maslahah* (public benefit), without compromising essential rights such as privacy, dignity, justice, and protection for utility alone

Results of Survey

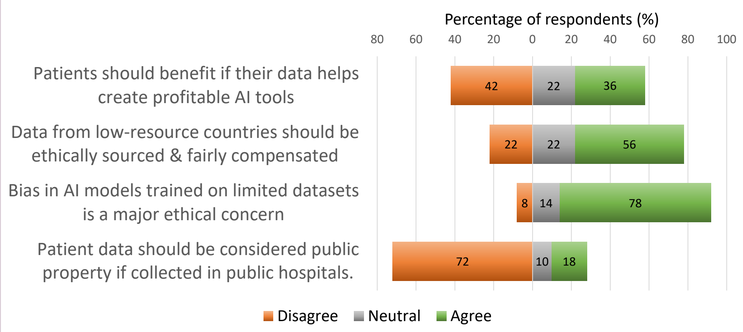
Consent and Autonomy
(Principlism, Deontology, Utilitarianism)



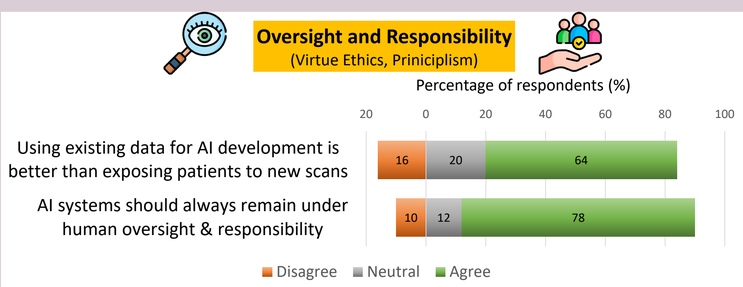
Transparency and Accountability
(Virtue Ethics, Deontology)



Fairness, Onwnership and Bias
(Principlism, Islamic Ethics)



Oversight and Responsibility
(Virtue Ethics, Priniciplism)



Key Results

- **Accountability & Oversight** (Principlism, Deontology) – 86% agreed on shared ethical responsibility; 78% supported human oversight.
- **Transparency** (Principlism, Virtue Ethics) – 82% supported transparency; 70% favored informing patients.
- **Bias** (Justice, Virtue Ethics) – 78% identified dataset bias as a major concern.
- **Fairness & Benefit-Sharing** (Justice, Islamic Ethics) – 56% supported fair sourcing; 50% supported patient benefit-sharing.
- **Ownership & Privacy** (Deontology, Islamic Ethics) – 72% rejected patient data as public property.
- **Consent vs Public Benefit** (Autonomy vs Utilitarianism) – 62% opposed non-consented use; views divided with anonymization/healthcare benefit.
- **Secondary Data Use** (Beneficence, Utilitarianism) – 64% supported re-use of existing data to reduce patient exposure.

Conclusion

Ethical use of patient data in radiology AI requires a **hybrid ethical approach**, as no single framework resolves all tensions. Transparency, human oversight, fairness, and shared responsibility emerged as the ethical minimum. The main challenge remains **balancing patient autonomy and consent with public benefit** and improved healthcare outcomes. Future AI governance should adopt transparent, accountable, and context-sensitive policies that protect patient rights while enabling ethically justified data use for societal benefit.

Discussion

- Previous studies identify privacy, transparency, accountability, and bias as major ethical concerns in healthcare AI (10,11), consistent with our findings.
- Current radiology ethics guidance emphasizes human oversight, transparency, and clear accountability rather than fully autonomous AI systems (11,12) similar to the opinion in our survey.
- Dataset bias is widely recognized in the literature (10,11,13), reflecting concerns raised in our survey.
- While imaging data has been described as a public good for future healthcare benefit (14), our respondents favored stronger patient ownership, privacy, and consent protections. International differences also exist (13,15,16), reflecting the tension between consent and public benefit seen in our results.
- Overall, both the literature and our findings support a hybrid ethical approach balancing autonomy, beneficence, justice, transparency, and accountability (17,18).

References

Questionnaire

Acknowledgement

- **Dr. Suneela Shaukat**, East Lancashire NHS Trust, UK
- **Dr. Aisha Y. Malik**, University of Warwick, UK
- **Dr. Sarosh Saleem**, Shalamar Hospital, Lahore, Pakistan