Ethical challenges of artificial intelligence-driven healthcare

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Ethical challenges

How to balance the risks and benefits of AI technology?

Improve efficiency of health care delivery and quality of patient care

vs.

Avoid/limit threats to privacy and confidentiality, informed consent, patient autonomy, patient safety

Key ethical principles for the use of AI for health

1. Protect autonomy
2. Promote human well-being, human safety & the public interest
3. Ensure transparency, explainability and intelligibility
4. Foster responsibility & accountability
5. Ensure inclusiveness and equity
6. Promote AI that is responsive & sustainable

Source: Ethics and governance of artificial intelligence for health: WHO guidance. Geneva 2021.

Key ethical principles for the use of AI for health

Grounded in four basis ethical principles

1. Non-maleficence (‘do no harm’)
2. Beneficence
3. Justice
4. Autonomy

Protect autonomy

Human autonomy should not be undermined

- Human should remain in full control of health-care systems and medical decisions
- AI systems should be designed to assist in making informed decisions
- Health care professionals should be able to override decisions made by AI systems

- Protect privacy and confidentiality & ensure informed, valid consent

Promote human well-being, human safety and the public interest

AI technologies should not harm people

- AI technologies should satisfy regulatory requirements for safety, accuracy & efficacy
- Specific measures should be in place to ensure quality control & quality improvement
  - *Are AI technologies working as designed?*
  - *Is there any detrimental effect on individual patients or groups?*

Ensure transparency and explainability

AI should be understandable to developers, users and regulators

Transparency

➔ sufficient information published or documented before the design and deployment

- *To facilitate meaning public consultation and debate on how is should be designed and how it should be used.*

Explainable

➔ information should be tailored, according to the capacity of those to whom the explanation is directed

➔ possible trade-off between full explainability of an AI algorithm (at the cost of accuracy) and improved accuracy (at the costs of explainability)

Foster responsibility and accountability

‘Human warranty’ – points of human supervision

- Responsibility of human stakeholders to ensure that AI technologies can perform specific tasks for which they are used under appropriate conditions
- Ensure that the algorithm remains on a machine-learning development path that is medically effective, can be interrogated and is ethically responsible
- Appropriate mechanism should be in place when something does go wrong (questioning and redress)
- Diffusion of responsibility: ‘everybody’s problem becomes nobody’s responsibility’ → collective responsibility

Ensure inclusiveness and equity

Widest possible appropriate, equitable used and access irrespective of age, gender, income, ability or other characteristics

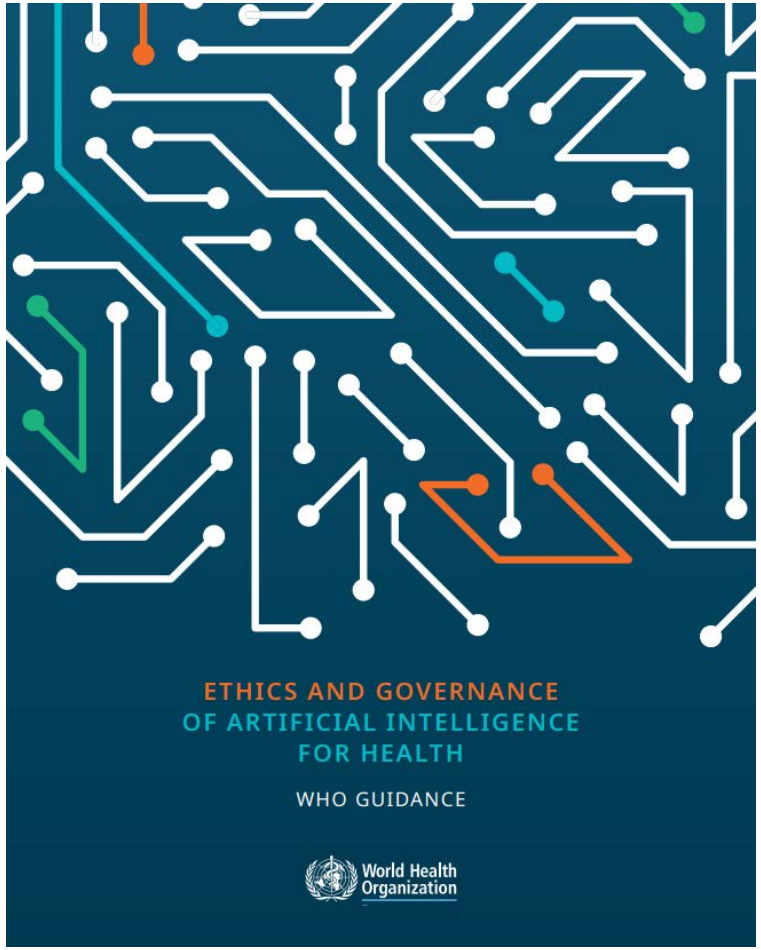
- Design and evaluation through stakeholders with diverse backgrounds
- AI technologies should be adaptable to context and needs of different settings (HIC vs LMIC)
- 'Digital divide' within and between countries should not be widened
- (Unintended) biases should be avoided or identified and mitigated
- Minimize inevitable power disparities (e.g. between providers & patients)
- Information technology literacy
- Open-source software – source codes publicly available

Promote artificial intelligence that is responsive and sustainable

Continuously, systematically and transparently monitoring

- Only introduce AI technologies that can be fully integrated and sustained in the health-care system
- Terminate use of technology if necessary
- Ecological footprint & energy efficiency
- Address anticipated disruptions to the workplace (e.g. training for health-care professionals, potential job losses, etc.)

WHO GUIDANCE



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Thank you!

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