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| ITU Logo | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2017-2020 | | FG-AI4H-M-043 | |
| **ITU-T Focus Group on AI for Health** | |
| **Original: English** | |
| **WG(s):** | | Plenary | E-meeting, 28-30 September 2021 | |
| **DOCUMENT** | | | | |
| **Source:** | | Editors | | |
| **Title:** | | Proposal for an ethics questionnaire on ethics considerations of AI4H | | |
| **Purpose:** | | Discussion | | |
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| **Abstract:** | This is a proposal for a version zero of an 'ethics questionnaire' for an ethics Q&A section in the topic description document (TDD)-template. This effort is being made following discussions within the WHO Expert Group on Ethics and FG-AI4H members on how to practically apply ethical key considerations in practice throughout the development, deployment, and use of AI technologies for health.  This draft zero of the ethics questionnaire is based on a revision by FG-AI4H WG-Ethics/WHO-Ethics Expert Group of the original ethics section in the TDD-template ([J-105](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/docs/FGAI4H-J-105.docx)).  NOTE: Work is still in progress and this version zero is intended to be used as a basis for further discussions/development by each of the technical groups as they work with AI technologies throughout the product lifecycle and encounter ethical challenges for which a wider community of practitioners would benefit from both identification and possible approaches to resolve such questions. |

# Introduction and background

The use of AI for health – including clinical medicine and public health – raises several ethical, human rights, legal, and social concerns that should be considered when evaluating an AI technology. The full range of ethical and human rights related concerns are discussed in deliverable [DEL01](https://extranet.itu.int/sites/itu-t/focusgroups/ai4h/_layouts/15/WopiFrame.aspx?sourcedoc=%7B0505B020-362C-45B2-94BF-215D2EBBD8F5%7D&file=DEL01.docx&action=default) "*AI4H ethics considerations*", which was developed by the working group on "Ethical considerations on AI4H" (WG-Ethics). The guidance [WHO EGAI4H] also identifies six principles that should guide the design, development, and deployment of any AI technology for health.

The six principles included in the guidance are the following:

* Protecting human autonomy
* Promoting human well-being and safety and the public interest
* Ensuring transparency, explainability, and intelligibility
* Fostering responsibility and accountability
* Ensuring inclusiveness and equity
* Promoting AI that is responsive and sustainable.

The report also provides recommendations to facilitate the appropriate governance of AI technologies for health, including the appropriate regulation of AI technologies. Such legal and non-legal governance of AI technologies can help to balance competing influences and demands and maximise the benefits of these technologies while addressing or mitigating ethical and human rights related concerns.

The report also identifies ten ethical challenges associated with the use of AI for health, several which are relevant for the appropriate evaluation of AI technologies from an ethical perspective.

# Questionnaire draft

The following questions reflect the different ethical concerns and challenges that different stakeholders – whether developers, programmers, regulators, and implementers, must grapple with to make appropriate and ethical use of AI technologies for health. These questions will eventually be categorised and sorted according to either a particular theme or ethical challenge, a particular type of technology or application, or an overlying question or concern that usually emerges with any specific technological application of AI for health.

## Ethics questions about the context and suitability

* *What elements of the context in which an AI technology will be introduced should a benchmark consider to be ethically based?*
* *To what extent should an existing digital divide, including by demographic factors within a country, affect the use of an AI technology in a specific context?*
* *What are the ethical implications if benchmarking is either inconsistent with or ignorant of the realities on the ground?*

## Ethics questions about the use of data including privacy and governance, security, safety

* *How should the approach to data collection be considered, including use and misuse, the use of informed consent, whether such informed consent was effective, and whether rights of privacy and confidentiality have been adequately protected, including according to existing data protection laws?*
* *How is personal health information protected and used (for example, considering longer data retention for documentation, data deletion requests from users, and the need for an informed consent of the patients to use data)?*
* *What governance structures should an authority that reviews an AI technology introduce to examine the collection and use of health data?*
* *How should such an authority engage with and coordinate with a data protection authority?*
* *How to assess risks to patient safety that may emerge over time, especially as an algorithm may evolve after real world use?*

## Ethics questions about human autonomy (and loss of)

* *What can be done to ensure the benefits of autonomous decision making are best equipped to improve medical and public health decision making and minimising ethical and human rights related risks?*

## Ethics questions about transparency

* *What standard of transparency and explainability should be required of an AI technology?*
* *What are the positive benefits of such transparency and explainability, and in what circumstances might such transparency and explainability be less desirable (especially as it relates to the utility of an AI technology)?*

## Ethics questions about fairness

* *How can there be assurance that training and validation data are representative and that an AI offers the same performance and fairness, e.g.*
* *can the same performance in high, low-, and middle-income countries be guaranteed?*
* *are differences in race, sex, and minority ethnic populations captured?*
* *are considerations about biases, when implementing the same AI application in a different context included?*
* *is there a review and clearance of 'inclusion and exclusion criteria' for test data?*
* *How to ensure that those individuals and programmers who design and develop an AI technology are representative of the populations who will rely on such technologies and to reassure providers that make use of such technologies?*

## Further ethics questions

* *Considering the impacts of climate change on human health – how should a designer assess the environmental (carbon) impact of AI technologies for health?*

# Individual ethics questions of the FG-AI4H topic groups

In this table each topic group can formulate ethics questions that might have come to their mind during the benchmarking process of their individual health AI technology.

| Del. N° | Topic group | Topic driver(s) | Ethics questions |
| --- | --- | --- | --- |
| 10\_01 | Use of AI in cardiovascular disease management | Benjamin Muthambi |  |
| 10\_02 | Dermatology | pending |  |
| 10\_03 | Diagnosis of bacterial infection and anti-microbial resistance | Nada Malou |  |
| 10\_04 | Falls among the elderly | Pierpaolo Palumbo |  |
| 10\_05 | Histopathology | Frederick Klauschen |  |
| 10\_06 | Malaria detection | Rose Nakasi |  |
| 10\_07 | Maternal and Child Health | Alexandre Chiavegatto & Filho Raghu Dharmaraju |  |
| 10\_08 | Neurological disorders | Marc Lecoultre |  |
| 10\_09 | Ophthalmology | Arun Shroff |  |
| 10\_10 | Outbreak detection | Stéphane Ghozzi & Auss Abbood |  |
| 10\_11 | Psychiatry | Nicolas Langer |  |
| 10\_12 | AI for Radiology | Darlington Ahiale Akogo |  |
| 10\_13 | Snakebite and snake identification | Rafael Ruiz de Castañeda |  |
| 10\_14 | Symptom assessment | Henry Hoffmann |  |
| 10\_15 | Tuberculosis | Manjula Singh |  |
| 10\_16 | Volumetric chest computed tomography | Kuan Chen |  |
| 10\_17 | Dental diagnostics and digital dentistry | Falk Schwendicke & Joachim Krois |  |
| 10\_18 | Falsified Medicine | Franck Verzefé |  |
| 10\_19 | Primary and secondary diabetes prediction | Andrés Valdivieso |  |
| 10\_20 | AI for endoscopy | Jianrong Wu |  |
| 10\_21 | Musculoskeletal Medicine | Yura Perov &Peter Grinbergs |  |
| 10\_22 | AI for human reproduction and fertility | Susanna Brandi &Eleonora Lippolis |  |
| 10\_23 | AI in sanitation for public health | Khahlil Louisy &Alexander Radunsky |  |
| 10\_24 | AI for point-of-care diagnostics | Nina Linder |  |

# References

[WHO EGAI4H] Ethics and governance of AI for health <https://www.who.int/publications/i/item/9789240029200>

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