A General Framework for Early Health Technology Assessment to Support the Development of New Radiology Artificial Intelligence Tools

HTA183

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Introduction - Despite the vast selection of available radiology artificial intelligence (AI) tools, relatively few are used in clinical practice. A gap exists between the functionality of the developed tools and valuable functions for the clinical practice.

Aim - To improve the use and value of radiology AI tools, early health technology assessment (eHTA) should be considered. However, a comprehensive eHTA for radiology AI tools is currently missing. The aim of this poster is to introduce and evaluate an eHTA procedure for AI in radiology.

Conclusions - The developed methodology is a rapid, systematic process which can provide a practical, comprehensive eHTA for AI in radiology. For future research, a health technology assessment will be performed to evaluate the eHTA predictive capacity

Methods

The proposed eHTA framework is an operationalization of the consensus based FUTURE-AI guideline for development and deployment of trustworthy AI tools in healthcare [2]. FUTURE-AI has been operationalized using:

- The ISPOR society "*good practices for Multiple Criteria Decision Analysis (MCDA)*" as method for early data collection [3].
- The EUnetHTA "*HTA Core Model ®*" to ensure comprehensiveness [1].

The proposed eHTA is evaluated in a radiology AI tool for the detection of incidental pulmonary embolisms.

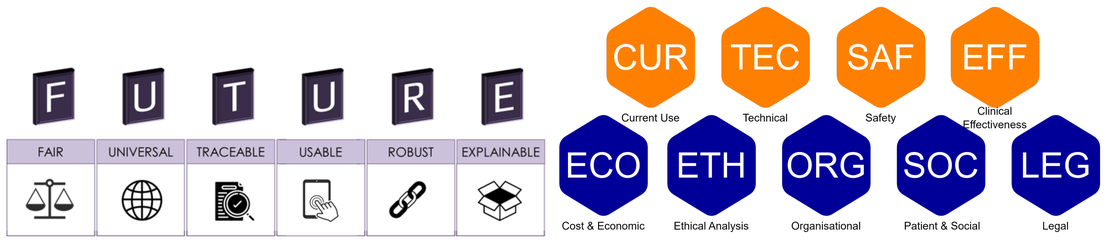

Figure 1: *FUTURE-AI guiding principles and HTA Core Model ® domains.*

Results

Figure 3 shows the eHTA process consisting of three phases:

- **Phase A - Project definition**, to structure and define the project, describe which decisions need to be made and identify stakeholders, including patients and clinicians.
- **Phase B - Criteria identification**, to describe alternative tool designs and evaluate assessment criteria for those tools with experts. (Figure 2)
- **Phase C - Scores evaluation**, to quantify the potential impact of the AI tool by aggregation of weights and performances of the criteria and alternatives, elicitated from a large group of stakeholders.

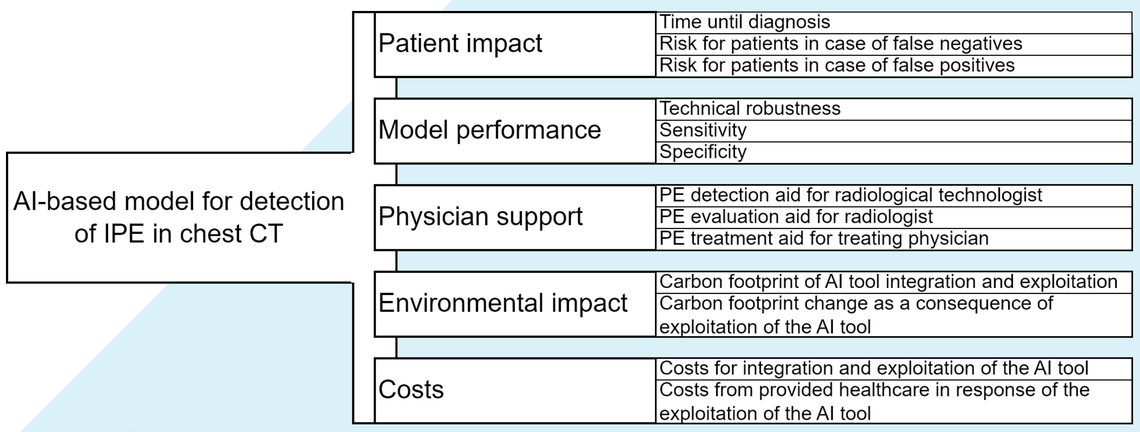

Figure 2: *The hierarchical criteria list resulting from the AI eHTA pilot study for incidental pulmonary embolism detection on CT.*

[1] Finn Børlum Kristensen, Kristian Lampe, Claudia Wild, and et al. The HTA core model ® —10 years of developing an international framework to share multidimensional value assessment. *Value in Health*, 20(2):244–250, 2017.

[2] Karim Lekadir, Aasa Feragen, Abdul Joseph Fofanah, and et al. FUTURE-AI: International consensus guideline for trustworthy and deployable artificial intelligence in healthcare. 2023.

[3] Kevin Marsh, Maarten Ijzerman, Praveen Thokala, and et al. Multiple criteria decision analysis for health care decision making - emerging good practices: Report 2 of the ISPOR MCDA emerging good practices task force. *Value in Health*, 19(2):125–137, 2016. Publisher: Elsevier Ltd.

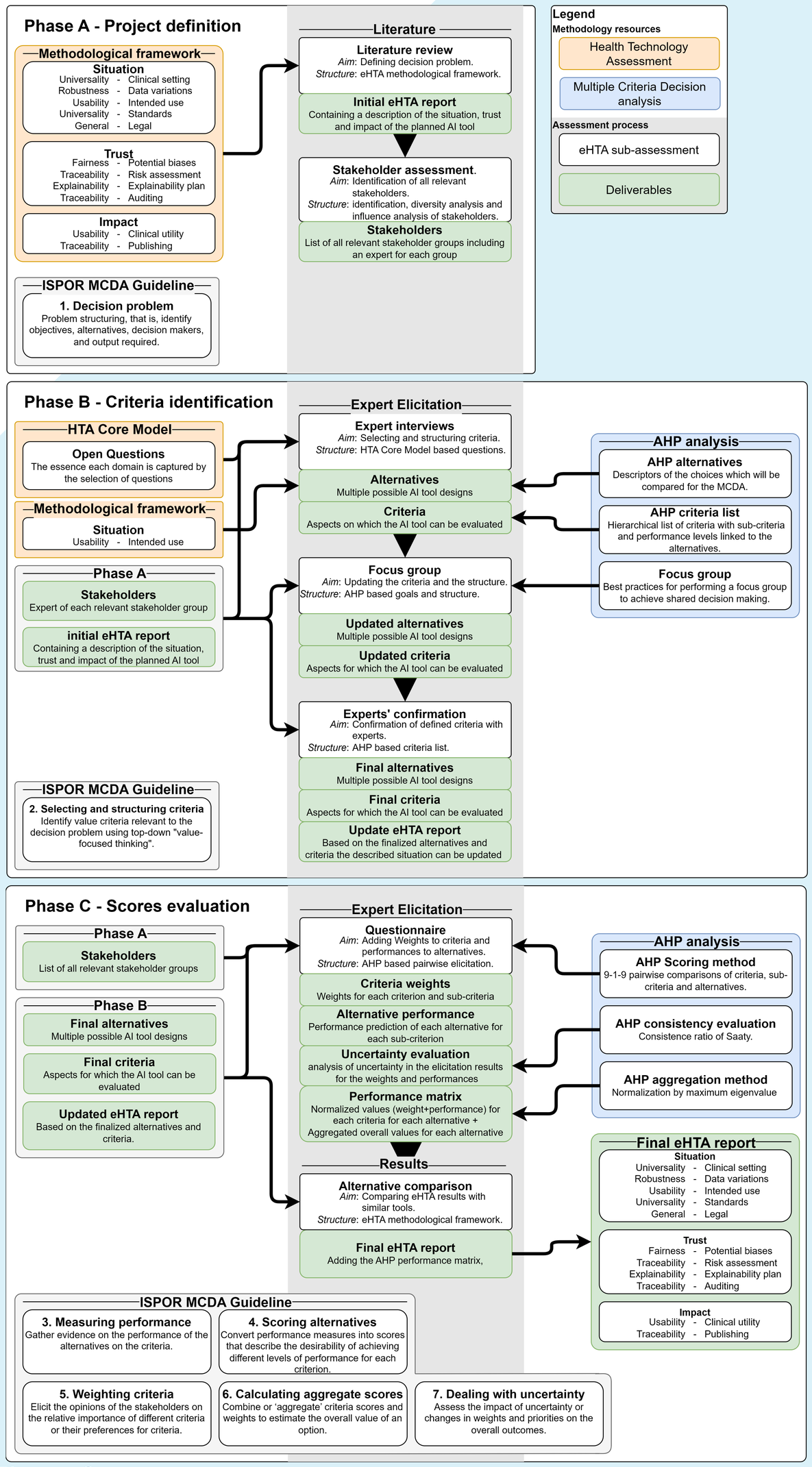

Figure 3: *Overview of the early Health Technology Assessment process organized in three chronologically ordered phases. The left column describes input data, the right column the used analysis. The centre column describes each sub-assessment and deliverable. For every phase the related ISPOR MDCA good practices [3] is provided.*