

Trustworthy artificial intelligence (AI) tools to predict the risk of chronic non-communicable diseases and/or their progression (RIA)

Subsidy:	€6M
Funding rate:	100%
Deadline:	First stage: 1 February 2022
	Second Stage: 6 September 2022
Duration:	No limit; up to 4 years is recommended
Total budget:	€60M

Consortium:

At least three legal entities established in different Member States or Associated Countries.

Involvement of end-users and SMEs is strongly encouraged.

Scope

It is widely recognised that health systems must put more emphasis on prevention and adopt a person-centred approach. Artificial intelligence (AI) along with the increased availability of health data hold great potential to pave the way for personalised prevention and enable progress towards risk prediction and early detection of chronic non-communicable diseases.

This topic will support multidisciplinary research, build on broad stakeholder engagement and support proposals developing novel robust and trustworthy¹ AI tools to enable timely personalised prevention approaches for chronic non-communicable diseases/disorders. The topic does not exclude any diseases/disorders.

Proposals are expected to develop and test AI tools for assessing and predicting the risk of developing a disease and/or the risk of disease progression once it is diagnosed, taking into account the individuals' (or groups) genotypes, phenotypes, life-style, occupational/environmental stressors and/or socio-economic and behavioural

¹ Ethics Guidelines for Trustworthy AI, published by the European Commission's High Level Expert Group on Artificial Intelligence, <https://ec.europa.eu/futurium/en/aiallianceconsultation/guidelines#Top>.

characteristics, as necessary. Sex and gender aspects should be considered, wherever relevant.

The AI tools may include a broad range of technological solutions on their own and/or in combination with other relevant state-of-the-art technologies (i.e. AI algorithms, mobile apps and sensors, robotics, e-health tools, telemedicine etc.)

Proposals should implement proof-of-concept studies to test and validate the performance of their AI tools in the real-world setting and compare their performance to the established practice.

The applicants should ensure that the AI tools developed are driven by relevant endusers/citizens/health care professionals needs. Therefore, the proposals are expected to introduce concrete measures for the involvement of the end-users throughout the AI development process and not only in the last phases of development. SME(s) participation is encouraged with the aim to strengthen the scientific and technological basis of SME(s) and valorise their innovations for the people's benefit. Proposals should address all of the following:

- Leverage existing high-quality health-relevant data from multiple sources (i.e. cohorts, electronic health records and registries, taking into account the individual's genotypic/phenotypic, medical, life-style, socio-economic, behavioural data etc.) and/or generation of new high-quality health data necessary for the rigorous development of the AI disease-risk tools.
- Develop the adequate performance metrics to assess the technical robustness of the developed AI tools for risk assessment of disease and/or disease progression and in particular their accuracy, reliability, reproducibility and generalisability. Proposals should assess the possible inherent bias introduced to the AI tools originating from the data quality used for their development.
- Develop the criteria to assess the effectiveness of the AI tools for disease risk assessment in terms of improving health outcomes and enabling personalised prevention strategies.
- Implement proof of concept and/or feasibility studies to validate the AI tools for risk assessment of disease and/or disease progression in a relevant end-users environment and/or real-world setting and assess their performance in comparison to the standard-of care.

Proposals should adhere to the FAIR² data principles and apply good practices for GDPR-compliant personal data protection. Proposals are encouraged to implement international standards and best practices used in the development of AI solutions.

Integration of ethics and health humanities perspectives to ensure an ethical approach to the development of AI solutions. In relation to the use and interpretation of data,

² FAIR data are data, which meet principles of findability, accessibility, interoperability, and reusability.

special attention should be paid to systematically assess for gender and ethnic bias and/or discrimination when developing and using data-driven AI tools.

To ensure citizens' trust, wide uptake by user communities and scalability of the solutions across clinical contexts, actions should promote the highest standards of transparency and openness of the AI tool, going well beyond documentation and extending to aspects such as assumptions, architecture, code and underlying data.

Applicants are highly encouraged to deliver a plan for the regulatory acceptability of their technologies and to interact at an early stage with the regulatory bodies, whenever relevant.

Expected Outcome

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 1 "Staying healthy in a rapidly changing society". To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to all of the following expected outcomes.

- Clinicians, medical professionals and citizens have access to and use validated AI tools for disease risk assessment. Hence, citizens are better informed for managing their own health.
- Health care professionals utilise robust, trustworthy and privacy-preserving AI tools that help them to assess and predict the risk for and/or progression of chronic noncommunicable diseases. Hence, citizens benefit from improved health outcomes.
- Health care professionals develop evidence-based recommendations and guidelines for the implementation of AI-based personalised prevention strategies. Hence, citizens benefit from optimized health care measures superior to the standard-of-care.
- Health care professionals employ quantitative indicators in order to identify and follow up on individuals with high risk for the development and/or risk for the progression of chronic non-communicable diseases.

Additional Information:

All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate. These networking and joint activities could, for example, involve the participation in joint workshops, the exchange of knowledge, the development and adoption of best practices, or joint communication activities. This could also involve networking and joint activities with projects funded under other clusters and pillars of Horizon Europe, or other EU programmes, as

appropriate. Therefore, proposals are expected to include a budget for the attendance to regular joint meetings and may consider to cover the costs of any other potential joint activities without the prerequisite to detail concrete joint activities at this stage. The details of these joint activities will be defined during the grant agreement preparation phase. In this regard, the Commission may take on the role of facilitator for networking and exchanges, including with relevant stakeholders, if appropriate.