JUNE 2025

STRATEGIC RESEARCH AND INNOVATION AGENDA (SRIA) ON PERSONALISED PREVENTION

PROPHET

a PeRsOnalized Prevention roadmap
for the future HEalThcare

Abstract

What is personalised healthcare ?

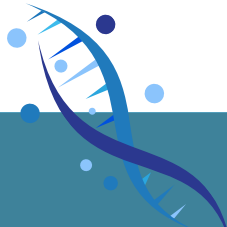
Personalised prevention is an emerging approach that uses individual data—such as genetics, lifestyle, and environment—to help prevent diseases before they develop. It shifts healthcare from reactive treatment to proactive risk reduction, empowering citizens and improving population health.

What the roadmap is trying to achieve ?

The Strategic Research and Innovation Agenda (SRIA), developed by the PROPHET project, identifies the main challenges and priorities for integrating personalised prevention into healthcare systems across Europe. It presents a roadmap based on the latest scientific evidence, stakeholder engagement, and policy analysis. Ten key challenges are explored, including data integration, ethical and legal issues, health equity, public engagement, and behaviour change.

What's next ?

We are now opening a public consultation to collect feedback on the draft SRIA. Professionals, policymakers, and citizens are invited to review the document, suggest additional priorities, and propose actions to enhance its relevance and impact. Your input will help ensure that the SRIA reflects shared societal needs and supports effective, fair, and sustainable implementation across Europe.



PROPHET
a PeRsOnalized Prevention roadmap for the future HEalThcare

Rapid SRIA overview

Strategic research and innovation agenda (SRIA) on personalised prevention

The paper reflects on 10 challenges for the implementation of personalised prevention in healthcare, empowering individuals to take control of their health and well-being.

The 10 challenges were identified on the basis of the latest research advancements in the field and after incorporating the views of the consortium partners and stakeholders.

The final outcome is a **more effective, efficient and citizen-centered preventive approach gathered in a document called concept paper.**

For each challenge, state of the art, gaps, priorities, implementation, and final considerations are detailed.

The SRIA outlines the major areas that must be addressed in order to fully realize the potential of personalised prevention.

- **Challenge 1 : The broad scope of promotion and prevention**
- **Challenge 2: Continuous evidence synthesis system supporting personalised prevention**
- **Challenge 3: The PROPHET Framework implementation**
- **Challenge 4: Data collection & integration, & Data Infrastructure**
- **Challenge 5: Community Engagement and trust**
- **Challenge 6 : Health Professionals and Policy Makers involvement**
- **Challenge 7: Regulatory aspects and synergy with private sector**
- **Challenge 8: Access, Equity and Coverage**
- **Challenge 9: Ethical, Legal, Social Issues (ELSI)**
- **Challenge 10: Changing behaviour**

I) The challenges of personalised prevention

Challenge 1 : The broad scope of promotion and prevention

📌 Context & Importance

- Chronic disease prevention involves complex interactions between lifestyle, environment, biology and social context
- The potential of a “precision dividend” lies in combining -omics advances (genomics, exposomics, microbiomics…) with public health strategies
- Emerging technologies must be integrated with broader social and environmental determinants to realise effective, personalised prevention

🔍 Research Gaps

- Limited integration of clinical, environmental and socioeconomic data
- Underexplored interactions between genes and modifiable risk factors (diet, pollution, stress…)
- Lack of external validity and representativeness of biomarker research
- Societal determinants under-addressed in omics-based prevention studies

🎯 Priorities & Implementation

1. Integrate omics with social, environmental and behavioural data
2. Strengthen population-based cohort studies with diverse, multimodal data
3. Focus on biomarkers reflecting modifiable risk factors
4. Leverage AI and wearables for data interpretation and real-time feedback

🚀 Key Considerations

- Multi-level integration: Prevention must operate across individual, community, and systemic levels
- Behavioural science is essential: predictive knowledge is insufficient without strategies for behavioural change
- Political, social and infrastructural barriers must be addressed for equitable access and implementation
- Climate, commercial determinants and inequalities are evolving and must be accounted for in personalised approaches

Challenge 2 : Continuous evidence synthesis system supporting personalised prevention

📌 Context & Importance

- Advances in genetic and ‘omics’ technologies improve disease prediction, but robust and continuous evidence is needed to demonstrate their real-world effectiveness (clinical utility)
- Integration requires not only clinical validation, but also consideration of ethical, contextual and societal dimensions

🔍 Research Gaps

- Lack of robust data on clinical efficacy
- Limited evidence on cost-effectiveness, equity, feasibility, ethics
- Insufficient quality control across omics fields
- Findings often not transferable across healthcare systems

🎯 Priorities & Implementation

1. Develop alternative study designs (e.g. focused RCTs, modelling)
2. Expand primary evidence (including PROs, contextual data)
3. Standardise & synthesise evidence with clear quality criteria
4. Integrate into health systems: interoperability, privacy, local adaptability
5. Include ethical and societal dimensions in evaluation

🚀 Key Considerations

- Adaptability to rapid technological change requires dynamic frameworks
- Investment must support both efficacy and broader impact studies
- Standardised methods are essential for transparency and reliability
- Ethical concerns (e.g. informed consent, equity) must guide implementation
- Multisectoral coordination is key to system-level integration

Challenge 3 : The PROPHET Framework implementation

📌 Challenge

- No widely accepted criteria for evaluating genetic & genomic tests in preventive healthcare, leading to inconsistent adoption across countries
- New EU HTA regulation (2025) aims to unify assessments but still lacks comprehensive evaluation beyond clinical efficacy and cost-effectiveness

🔍 Key Gaps

- Limited primary evidence makes informed decision-making difficult
- Lack of consensus on dimensions and indicators for evaluation
- Traditional HTA undervalues feasibility, acceptability, equity, and social determinants
- Broader societal impacts and stakeholder perspectives often neglected

🎯 The PROPHET Framework: A Holistic Approach

1. Expands HTA evaluations to include health system & value-based perspectives
2. Integrates Health Impact Assessment (HIA) to assess feasibility, equity, and social implications
3. Engages diverse stakeholders (patients, clinicians, policymakers, communities) in the evaluation process
4. Includes structured monitoring to guide policy adaptation based on emerging evidence
5. Supports context-specific assessment (e.g. reimbursement policies, mandatory testing requirements)

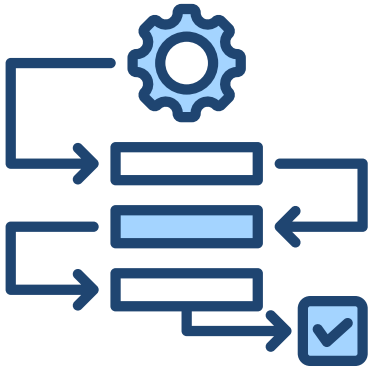
🚀 Key Considerations for Implementation

- Regulatory Alignment
- Stakeholder Engagement
- Comprehensive Evaluation
- Continuous Monitoring

Challenge 4 : Data collection & integration, & Data Infrastructure

📌 Challenge

Rapid expansion of life science data offers new opportunities to personalised prevention, but fragmentation, limited accessibility and poor integration hinder its potential.Infrastructure and data-sharing frameworks remain insufficient for complex, multi-sectoral data.Improved data management is essential.



🔍Key Gaps

- Lack of standardisation & poor data discoverability
- Limited accessibility due to legal, technical, and literacy barriers
- Fragmented and low-quality data impedes integration
- Low reproducibility due to missing metadata and inconsistent formats
- Data-sharing concerns (reidentification, security, consent)
- Limited infrastructure for federated, multi-modal, multi-sectoral data analysis

🎯 Priorities & Implementation

- Standardisation
- Discoverability
- Accessibility
- Reproducibility
- Secure Data Sharing
- Integration
- Clinician-Friendly Tools
- Interdisciplinary Cooperation

🚀Key Considerations

- Link diverse data for prevention research.
- Build capacity in key data functions.
- Improve metadata for AI integration.
- Ensure secure, interoperable systems.
- Align standards through joint governance.

Challenge 5 : Community Engagement and trust

📌 Challenge

- Personalised prevention requires well-informed citizens and patients actively involved in research, care, and governance.
- Yet awareness of genetics and participation options remains low, and engagement practices are fragmented across sectors.

🔍 Key Gaps

- Limited public knowledge and information on genetics and personalised prevention
- Health professionals lack training and time to guide patients
- Engagement efforts lack structure, evaluation, and continuity
- Coordination across sectors (health, education, policy) is weak
- Vulnerable groups face barriers due to limited digital and health literacy

🎯 Priorities and implementation

1. Engage and empower citizens,patients and their associations
2. Boost education and awareness
3. Ensure structural funding for engagement
4. Develop inclusive digital tools
5. Foster cross-sector coordination

🚀 Why It Matters

- Building trust and engagement is essential for personalised prevention. Informed citizens and patients can better understand risks, participate in decisions, and contribute to research—leading to more inclusive, culturally sensitive, and effective healthcare.

Challenge 6 : Health Professionals and Policy Makers involvement

📌 Challenge

Healthcare professionals and policymakers are key to implementing personalised prevention but lack training, resources, and coordinated engagement.

🔍 Key Gaps

- Lack of economic models and cost-effectiveness evidence
- Gaps in training for non-genetic professionals
- Fragmented policymaking and insufficient coordination

🎯 Priorities & Implementation

- Train professionals on personalised prevention, equity, and data use
- Build policymaker capacity through tailored education tools
- Develop national action plans to align practices and policies

Challenge 7 : Regulatory aspects and synergy with private sector

📌 Challenge

- Public-private partnerships (PPPs) are essential for innovation in prevention, but fragmented regulations, privacy concerns, and lack of trust hinder collaboration.

🔍 Key Gaps

- Inconsistent regulations across countries
- Unclear data-sharing and secondary data use rules
- Public scepticism toward private sector engagement

🎯 Priorities

- Create regulatory sandboxes and shared platforms
- Incentivise responsible private partnerships with safeguards
- Align EU-level rules for wearable data, DTC tests, and PPPs
- Evaluate PPPs regularly and educate citizens on benefits

Challenge 8 : Access, Equity and Coverage

📌 Challenge

- Personalised prevention must be universally accessible, but socio-economic inequalities, health literacy gaps, and digital exclusion hinder fair implementation across Europe.

🔍 Key Gaps

- Low health literacy and limited preventive care uptake among vulnerable groups
- Digital exclusion and underuse of e-health tools
- Unequal reimbursement and access across EU countries

🎯 Priorities and implementation

1. Strengthen health & digital literacy through targeted outreach and inclusive communication
2. Integrate personalised prevention in national health systems with equitable reimbursement
3. Support affordable digital tools via cross-sector partnerships (incl. private sector)
4. Promote EU-level harmonisation to ensure fair access and rights

Challenge 9 : Ethical, Legal, Social Issues (ELSI)

📌Challenge

Personalised prevention depends on sensitive data, raising concerns over consent, privacy, fairness, and ethical use.

🔍Key Gaps

- Unclear consent and data-sharing practices
- Risks in linking datasets and commercial use
- Limited public trust and unclear benefit evidence

🎯Priorities & Implementation

- Strengthen informed consent tools
- Build trust with transparent communication
- Address equity, access, and fair use of outcomes
- Promote collaborative ELSI research

Challenge 10: Changing behaviour

📌Challenge

- Behaviour change is crucial for prevention but complex—mere information is not enough to drive action.

🔍Key Gaps

- Misunderstandings of genetic risk and determinism
- Low uptake of preventive actions and testing
- Lack of personalised, motivating communication

🎯Priorities

- Improve communication tools using behavioural science
- Design tailored, multi-level interventions (e.g. nudges, reminders)
- Promote informed, autonomous decision-making with ethical messaging

PROPHET
a PeRsOnalized Prevention roadmap for the future HEalThcare

II) Background and Methodology

About PROPHET

48 months

18 partners

12 countries

Funded by the European Union

develop a comprehensive roadmap for integrating personalised prevention into European healthcare systems

10 expected oucomes:

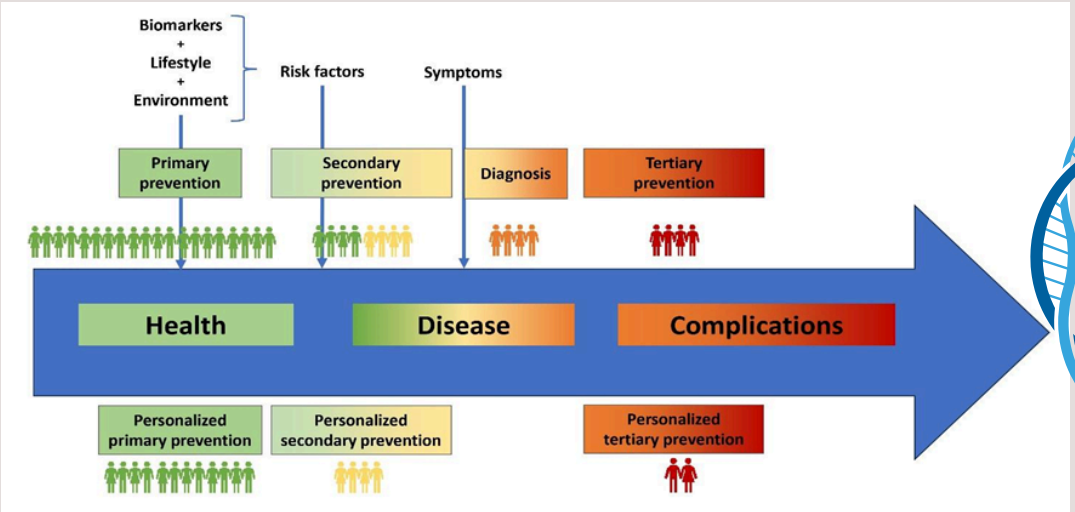
- Comprehensive Personalised Prevention Roadmap
- Strengthened Collaborative Ecosystem
- In-Depth Research Advancements
- Evaluative Frameworks and Indicators
- Empowered Public Health Authorities
- Raised Awareness Among Citizens, Patients and healthcare profesionals + citizen engagement
- Informed Policymakers & Stakeholders
- Drafting of the Strategic Research and Innovation Agenda (SRIA) on Personalised Prevention

Why personalised prevention?

Chronic diseases remain the main cause of morbidity and mortality in Europe.

The traditional reactive healthcare model, which focuses on treating established diseases, must evolve into personalised prevention, which prioritises early diagnosis and risk reduction.

to learn more, click here



Description of the three levels of prevention, according to the disease stage

PROPHET
a PeRsOnalized Prevention roadmap
for the future HEalThcare

3 types of prevention

- 🏥**Primary Prevention:** Aims to prevent the onset of diseases before they occur by addressing risk factors (e.g., vaccination, healthy lifestyle promotion).
- 🩺**Secondary Prevention:** Focuses on early detection and timely intervention to prevent disease progression (e.g., cancer screening).
- 💊**Tertiary Prevention:** Seeks to reduce complications and improve the quality of life in individuals with established diseases (e.g., rehabilitation programs, personalized treatments).

What data drives PROPHET's personalised prevention?

One of the fundamental theoretical underpinnings of PROPHET is the "Vision Paper on Personalised Medicine Research & Implementation by 2030" by ICPerMed.

PROPHET personalised prevention focus on individual omics data :

genomics, metabolomics, proteomics, radiomics, epigenomics

Clinically actionable applications

- 🚀 **Genetic Testing for High-Risk Pathogenic Variants** – Identifying individuals with significant genetic predispositions.
- 📊 **Polygenic Risk Scores (PRS)** – Estimating disease susceptibility based on multiple genetic markers.
- 💊 **Pharmacogenomics** – Tailoring drug therapies to individual genetic profiles for enhanced treatment efficacy.

These applications highlight the practical aims of this initiative and serve as focal points for **advancing personalised prevention through clinically actionable genomics data.**

Promising Stories in Personalised Prevention

Estonia

The e-Health system and national biobank facilitate secure access to medical data and enhance healthcare practices.

Finland

Tools allow citizens to assess their risk of type 2 diabetes and adapt their lifestyle accordingly.

Studies like P5.fi and GenomeHealth integrate genetic data into preventive medicine.

PROPHET Synergies with Other Initiatives

The EU Cancer Plan

Promotes personalised prevention, particularly within the framework of the 31.2 Roadmap to Personalised Prevention.

ICPerMed and EP PerMed

Bring together 60 European partners to advance personalised medicine in healthcare systems.

The 1+Million Genomes (1+MG) and Genomic Data Infrastructure (GDI) initiatives

Facilitate secure access to genomic data to enhance research and healthcare services.

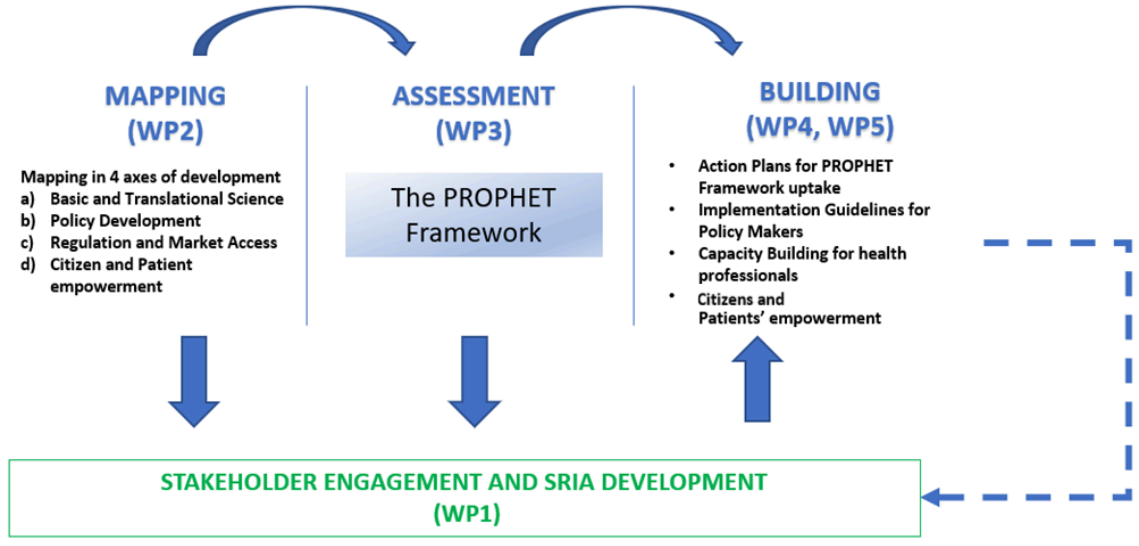
The European THCS Partnership

Supports healthcare system transformation by promoting digitalisation and innovation for a more sustainable and efficient care model.

Methodology for SRIA Development

The SRIA is based on three key phases of the PROPHET project:

- **Mapping**: In-depth analysis of the state of personalised prevention in Europe and beyond.
- **Assessment**: Evaluation of approaches before their implementation.
- **Building**: Presentation of the results from the concrete application of the PROPHET methodology.



Concept Paper for Personalised Prevention

Need

Balance between targeted interventions for high-risk groups and preventive actions for the general population.

Challenges

- data access
- ethics and community engagement
- integration of interventions into the healthcare sector
- health inequalities
- large-scale implementation

Strategy

Based on data integration (biomarkers, lifestyles, environmental factors) and a multisectoral approach, involving all healthcare stakeholders.

To maximise its impact, PROPHET advocates for a comprehensive prevention approach, combining technological advances and data integration into public health policies.

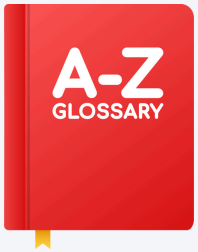
Stakeholder Engagement Strategy

1. Stakeholder mapping process
2. Engagement strategy
3. PROPHET forum

Delphi Consultation

The Delphi consultation was a structured, multi-phase process designed to gather expert insights and build consensus on the SRIA, ensuring it addressed key priorities for personalised prevention. It began with the Stockholm 2024 workshop, during which stakeholders reviewed the draft SRIA, engaged in discussions, and provided feedback through structured rounds, refining priorities over five months before progressing to the next phase.

This inclusive approach ensures the SRIA reflects diverse perspectives and leads to a more impactful and widely accepted strategy for personalised prevention.



Glossary box

- **Omics sciences**: A group of scientific fields that study different types of biological data (like genes, proteins, or metabolites) to better understand how the body works.
- **Biomarkers**: Biological indicators (such as molecules in blood or tissues) that can signal the presence of a disease or the effects of a treatment.
- **Genomics**: The study of all genes in a person's DNA and how they interact with each other and the environment.
- **Exposomics**: The study of all the environmental exposures a person experiences throughout life and how these affect their health.
- **Microbiomics**: The study of the microorganisms (like bacteria and fungi) living in and on the human body, and their role in health and disease.
- **Genetic**: Relating to genes or heredity—how traits and conditions are passed from parents to children through DNA.

PROPHET

a PeRsOnalized Prevention roadmap
for the future HEalThcare

To find more about the PROPHET rapid scoping review, check the corresponding deliverable: **HERE**.

More about the project on our website: https://prophetproject.eu/
And follow us on LinkedIn:

@PROPHET.EU