JUNE 2025

A Personalized Prevention roadmap for the future Healthcare

PROPHET

a PeRsOnalized Prevention roadmap
for the future HEalThcare

Abstract

What is personalised healthcare ?

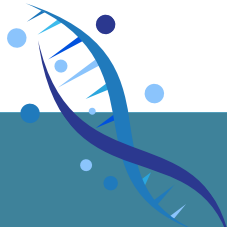
Personalised prevention is an emerging approach that uses individual data —such as genetics, lifestyle, and environment—to help prevent diseases before they develop. It shifts healthcare from reactive treatment to proactive risk reduction, empowering citizens and improving population health.

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.



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

- **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**

Challenge 1 : The broad scope of promotion and prevention

🧭**Context**:
Personalised prevention should move beyond genetic and clinical risks to incorporate behavioural, social and environmental determinants.

Priorities and actions:

- 🧬 Integrate omics, environmental, social and behavioural data
- 🧪 Strengthen population-based prevention studies
- 🔬 Use biomarkers to monitor modifiable risk factors
- 🤖 Leverage wearable technologies

Obstacles:

- 🔄 Fragmented data and governance
- 🧩 Disconnected preventive policies
- 📉 Limited behavioural data in health systems

Expected results:

- 🌍 Population-sensitive prevention strategies
- 📲 Scalable personalisation tools
- 🔗 Better coordination of services

Actors responsible:

- 🏛️ Policymakers, citizens, EU
- 🩹 Professionals
- 🎓 Research community

Funding sources:

- 🏛️Eu calls and European Commission fundings (Horizon Europe, EU4Health...)

Similar EU-funded initiatives:

- 🧬 PARC
- 🧠 EXPANSE
- 🌐 1+Million Genomes

Output indicators:

- 📌 Number of integrated prevention initiatives
- 📲 Uptake of digital and behavioural tools
- 🎯 Share of targeted populations reached
- 👥Number of member states, citizen, patient and scientific publications

Challenge 2: Continuous evidence synthesis system supporting personalised prevention

📌 Context

- Real-world, quality evidence is essential to validate the effectiveness and impact of personalised prevention tools.

🔍Priorities and actions

- Promote pragmatic and real-world study designs
- Systematise synthesis of population-specific evidence
- Link evidence generation with health system use
- Include ethical and social dimensions

🎯 Obstacles:

- Heterogeneity of methodologies
- Disconnection from implementation pathways
- Limited multidisciplinary frameworks

🚀Expected results

- Strong evidence base for decision-making
- Transparent validation procedures
- Scalable good practices

🏛️Actors responsible

- Research institutions
- HTA bodies
- Public health authorities

💶Funding sources :

- Horizon Europe
- Joint Programming Initiatives (JPI)
- EU4Health

🧬Similar EU-funded initiatives

- ICPerMed, EPPerMed
- EHDS, Horizon Europe ERNs
- Member State HTACG

📈Output indicators

- Number of context-adapted evaluations
- Guidance documents published
- Uptake of evidence by policymakers

Challenge 3 : The PROPHET Framework implementation

🧭Context:
A common evaluation framework is needed to assess personalised prevention tools beyond clinical outcomes, including feasibility, social value and ethical considerations.

Priorities and actions:

- 📊 Expand Health Technology Assessments (HTAs) to include system-wide and societal impacts
- ⚖️ Integrate Health Impact Assessment (HIA) criteria
- 👥 Engage citizens and stakeholders in evaluation processes
- 🔄 Create structured monitoring and policy feedback systems
- 🌍 Support context-specific assessments (e.g. reimbursement, accessibility)

Obstacles:

- 🧱 Lack of harmonised evaluation criteria across countries
- 📉 Weak integration of feasibility and social value dimensions
- 👥 Limited stakeholder involvement in decision-making

Expected results:

- 📊 Coherent and accepted evaluation methodologies
- 🧩 Improved policy alignment across Member States
- 📚 Broader inclusion of ethical and social impacts in assessments

Actors responsible:

- 🧮 HTA agencies
- 🏛️ Health ministries
- 🎓 Research institutions and universities

Funding sources:

- 🏛️ Horizon Europe
- 💡 Digital Europe
- 🩺 EU4Health

Similar EU-funded initiatives:

- ⚙️ EUnetHTA
- 🧠 PERMIT
- 🧬 IHI projects on precision prevention

Output indicators:

- 🟦 Number of evaluations using PROPHET Framework
- 🔍 Inclusion of equity, feasibility and acceptability in assessments
- 🔁 Monitoring and adaptation processes in place

Challenge 4: Data collection, integration & Data Infrastructure

📌 Context

- Secure, interoperable and FAIR-compliant infrastructure is vital for combining omics, clinical, environmental, and social data.

🔍 Priorities and actions

- Link multimodal data across platforms and institutions
- Improve metadata quality and data discoverability
- Ensure privacy, data security and governance
- Facilitate AI-ready, interoperable systems

🎯 Obstacles:

- Fragmented infrastructure and siloed data systems
- Legal, technical, and literacy-related barriers
- Low reproducibility and poor standardisation

🚀 Expected results

- Increased data integration across disciplines
- Higher data quality and reuse
- Infrastructure enabling personalised prevention research and services

🏛️ Actors responsible

- National and EU health data authorities
- Research infrastructure bodies (e.g. ELIXIR)
- Data protection agencies

💶 Funding sources :

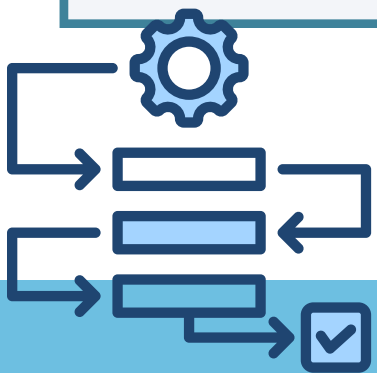
- Horizon Europe
- Digital Europe
- EU4Health

🧬 Similar EU-funded initiatives

- European Health Data Space (EHDS)
- TEHDAS
- 1+Million Genomes Initiative

📈 Output indicators

- Number of interoperable systems deployed
- Compliance with FAIR and GDPR principles
- Increase in data reuse for prevention



Challenge 5: Community Engagement and trust

🧭**Context**:
Public trust and informed participation are essential for equitable and effective implementation of personalised prevention.

Priorities and actions:

- 🧠 Raise awareness and improve health literacy
- 🤝 Engage citizens in co-design and decision-making
- 🌐 Develop inclusive and accessible digital tools
- 💶 Ensure structural funding for engagement
- 🔄 Promote intersectoral collaboration (e.g. education, municipalities)

Obstacles:

- 📉 Low awareness of personalised prevention
- 🌐 Digital and health literacy divides
- 📉 Weak continuity and evaluation of engagement

Expected results:

- 🧠 Improved citizen empowerment
- 🤝 More inclusive and trust-based healthcare models
- 📈 Increased participation and adoption of tools

Actors responsible:

- 👩‍🤝‍👨 Civil society organisations
- 🏛️ Local authorities and health ministries
- 🧫 Research institutions

Funding sources:

- 🏛️ Horizon Europe
- 🩺 EU4Health
- 🤝 Public-private partnerships

Similar EU-funded initiatives:

- 🔬 Genomics4All
- 💬 1Million Genomes' Citizen Juries
- 🌍 TEHDAS (engagement module)

Output indicators:

- 🧭 Number of citizens engaged
- 📊 Trust and literacy level improvements
- 💬 Stakeholder satisfaction indicators

Challenge 6 : Health Professionals and Policy Makers involvement

📌 Context

- Capacity building for professionals and policymakers is critical to foster system-wide adoption of personalised prevention.

🔍Priorities and actions

- Provide interdisciplinary training on genomics, data, ethics
- Develop educational tools for policymakers
- Promote national prevention strategies with coordinated action plans

🎯 Obstacles:

- Insufficient training in prevention for non-genetic professionals
- Fragmented or inconsistent policy frameworks
- Lack of integration between research and practice

🚀Expected results

- Enhanced health workforce capacity
- Better policy alignment and coordination
- Efficient translation of research into policy

🏛️Actors responsible

- Training institutions and health professional bodies
- Ministries of Health and Education
- Policy think-tanks

💶Funding sources :

- Horizon Europe
- EU4Health
- Structural Funds (ESF+)

🧬Similar EU-funded initiatives

- BeWell
- Ongoing IHI training modules
- EU Cancer Mission’s workforce strategies

📈Output indicators

- Number of professionals trained
- Availability of national guidance documents
- Adoption of national prevention strategies

Challenge 7: Regulatory aspects and synergy with private sector

🧭**Context**:
Clear regulatory frameworks and trusted public-private partnerships are key to advancing responsible innovation.

Priorities and actions:

- ⚖️ Develop EU-aligned regulatory sandboxes
- 🤝 Foster open platforms and co-regulatory mechanisms
- 💶 Align incentives and clarify liability and benefit-sharing
- 👨‍💼 Empower citizens with transparent communication on data use

Obstacles:

- 🔀 Fragmentation in national regulatory environments
- 🔐 Uncertainty on data sharing and secondary uses
- 💬 Public mistrust toward private sector

Expected results:

- 🧭 Harmonised and trusted regulatory pathways
- 💡 Responsible innovation in personalised prevention
- 📊 Increased citizen acceptance and participation

Actors responsible:

- ⚖️ Regulatory authorities and ethics councils
- 🏛️ EU and national policymakers
- 👨‍💼 Industry and innovation hubs

Funding sources:

- 🏛️ Horizon Europe
- 💶 InvestEU
- 🧪 National innovation funds

Similar EU-funded initiatives:

- 🔐 TEHDAS
- 🧠 IHI PPP projects
- ⚖️ EHDS governance pilot

Output indicators:

- ⚖️ Regulatory frameworks adopted
- 🟦 Co-regulation platforms created
- 🔍 Increased participation in innovation pilots

Challenge 8: Access, Equity and Coverage

📌 Context

- Access, equity, and trust in personalised prevention depend on sustained investment, fair digital inclusion, and the ethical use of technologies. There is a need to shift from treatment to prevention, supported by robust public funding, inclusive infrastructures, and citizen confidence in digital tools.

🔍 Priorities and actions

- Fund citizen involvement in prevention research.
- Support infrastructure for accessible check-ups.
- Ensure ethical rules and data privacy in digital health.
- Provide analogue and accessible options.
- Launch education campaigns on digital health.
- Develop policies for fair benefit distribution.

🎯 Obstacles:

- Few incentives to shift from care to prevention.
- Digital inequalities and biases in technologies.
- Low patient trust in digital tools.
- Unequal access to benefits of personalised prevention.

🚀 Expected results

- More people use prevention services (e.g. check-ups, vaccines).
- Citizens participate more in research and decision-making.
- Digital tools help people manage their health.
- Prevention benefits are distributed fairly & transparently.

🏛️ Actors responsible

- EU, national, regional, local policymakers.
- Health professionals, citizens, researchers, civil society.
- Technology developers, governments, regulators.
- Healthcare providers, research funders.

💶 Funding sources :

- EU, national and local health and research budgets.
- Government funding linked to personalised prevention.

🧬 Similar EU-funded initiatives

- EHDS, TEHDAS & TEHDAS2.
- GDPR, AI Act, eHealth Network.
- EU plan on hospital and provider cybersecurity.

📈 Output indicators

- Number and size of prevention programmes.
- Population use and views on digital health tools.
- Long-term funding plans at government level.
- Reports on access and equity.

Challenge 9 : Ethical, Legal, Social issues

🧭Context:
Personalised prevention raises new ethical and legal concerns. Action is needed to ensure trust, fairness, and data protection, especially in international and cross-sector contexts.

Priorities and actions:

- 🔒 Create ELSI guidelines and communication safeguards
- 📜 Harmonise data protection rules across borders
- 🤝 Align public-private partnerships with ethical standards
- 🌍 Support international ELSI cooperation and capacity building

Obstacles:

- ⚠️ Data misuse, privacy breaches, and discrimination risks
- ⚖️ Complex legal environments and lack of common standards
- 🧠 Ethical issues in fast-moving technologies (AI, genomics…)
- ⚙️ Difficulty in balancing public good and private interests

Expected results:

- ✅ Improved trust and awareness
- 🟦 Clear ELSI rules at EU and national levels
- 🛡️ Ethical data practices in R&I and health systems
- 🔗 Better international alignment on ELSI standards

Actors responsible:

- 🏛️ Governments, regulators, data protection agencies
- 👴⚖️ Ethics committees, academia, civil society
- 🏥 Industry, health funders, and patient organisations

Funding sources:

- 💶 EU and national public programmes
- 🏛️ Horizon Europe, EU4Health, Digital Europe
- 🏦 Private sector and international partnerships

Similar EU-funded initiatives:

- 🔗 TEHDAS, EHDEN, GA4GH
- 🟦 Towards EHDS, SHAI-PED
- 🧬 EP PerMed, EUCAIM, IDERHA

Output indicators:

- 📊 Number of guidelines published
- ✅ Compliance rates (data use, PPPs)
- 🌍 International ELSI collaborations and joint publications

Challenge 10: Changing behaviour

📌 Context

- More behavioural research is needed on personalised prevention. Existing disciplines (genetics, pharmacy, public health) remain siloed. Communicating genetic risk does not always change behaviour.

🔍Priorities and actions

- Study the acceptability and effectiveness of personalised prevention
- Research how context influences motivation and decision-making
- Investigate the behavioural impact of pharmacogenomics and lifestyle advice
- Develop strategies to inform and support high-risk family members.
- Determine when and where polygenic risk scores (PRS) have clinical utility

🎯 Obstacles:

- Difficulty translating risk communication into behaviour change.
- Legal limits on sharing genetic risk within families.
- Lack of coordination across scientific disciplines.
- PRS are population-specific and may misrepresent total risk.

🚀Expected results

- New evidence on behavioural drivers and motivation.
- Development of guidance modules for family communication.
- Validated tools for assessing PRS in clinical settings.

🏛️Actors responsible

- Academia and research funders.
- Public health authorities and regulatory bodies.
- Personalised prevention professionals and patient organisations.
- European agencies such as EMA, ESHG, ASHG.

💶Funding sources :

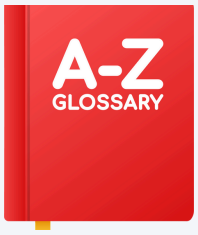
EU and national research grants.

🧬Similar EU-funded initiatives

- ELSAIDTCGT
- Can.Heal
- EU Genomics Platform

📈Output indicators

- Number of scientific publications.
- Number of modules developed to support family communication.
- Implementation of relevant regulation.
- Evidence on PRS use in combined risk tools.



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.

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

More about the project on our website: https://prophetproject.eu/
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