Topic idea submitted to IHI - Reference Number: TI_001244

Are you submitting the idea:
☐ **in your personal capacity?**
☒ **on behalf of an organisation?**

Please select from the list below the type of stakeholders your organization represents: Non-governmental organisation (NGO)

1 Title of your idea

Please provide a short title that accurately reflects the objective(s) of your idea:
Enhancing EU Competitiveness by Integrating Pragmatic Trials and Real-World Evidence in Precision Oncology

2 Scope

Explain the specific challenges/problems to be addressed by your idea and how these affect relevant stakeholders, taking into account what is already known and/or available in the field:
In precision oncology, trials face three key challenges:

1. Patient recruitment: Finding biomarker-defined patients who are both fit and eligible for trials is costly and time-consuming. The rarity of suitable patients, given mutation frequencies makes recruitment difficult.

2. Regulatory complexity: European clinical trials are burdened by stringent regulations and GDPR compliance, slowing trial approval and recruitment. The EU has lost clinical trial market share to the US and China, which offer faster, more cost-effective frameworks. European payers have been slow to embrace innovative therapies due to uncertainties around their long term benefits.

3. Data collection costs: Precision trials require high-quality clinical data, especially for radiological outcomes like Overall Response (OR) and Progression-Free Survival (PFS), which are expensive to collect manually. This adds a significant financial burden but could be automated.

While real-world evidence (RWE) has potential to address these issues by screening patients, offering control arms, and tracking long term outcomes, it has been hampered by the heterogeneity of clinical data across Europe, complexity of target data in many trials and challenges in regulatory alignment (including GDPR).

Pragmatic platform trials and hospital based federated registries offer solutions by simplifying trial designs, standardizing routine molecular – clinical – outcome data. They could be extended to leverage AI to automate radiological outcome measurements.

Together, these innovations could reduce trial costs (especially for next-indication trials), accelerate recruitment, and improve Europe’s competitive standing in global oncology trials. These approaches also support evidence-based reimbursement decisions, addressing payers’ concerns about medical benefit uncertainty.

Please indicate which IHI specific objective(s) (SO), as described in the IHI Strategic Research and Innovation Agenda (SRIA), your idea addresses:

["SO4: exploit the full potential of digitalisation and date exchange in heath care"
"SO1: contribute towards a better understanding of the determinants of health and priority disease areas"
"SO2: integrate fragmented health research and innovation efforts bringing together health industry sectors and other stakeholders, focusing on unmet public health needs, to enable the development of tools, data, platforms, technologies and processes for improved prediction, prevention, interception, diagnosis, treat- ment and management of diseases, meeting the needs of end-users"
"SO3: demonstrate the feasibility of people-centered, integrate health care solutions"]

Please select the keywords that are most relevant to your idea:

["Oncology"
"Treatment"
"Disease management"
"Digital health"]

In alignment with the IHI specific objective(s) selected above, specify the objectives of your idea:

1. Federated Precision Oncology Registry Development: Align on an open standard, multi-vendor technology stack to enable a Europe-wide, federated clinical registry for all cancers, integrating standardized molecular, clinical, and outcome data held securely in participating hospitals' databases.

2. Radiographic Outcome Automation: Develop open-source AI for automating objective response (OR) and progression-free survival (PFS) assessments across multiple cancer types, ensuring compatibility with major X-ray vendors to enhance scalability and clinical uptake.

3. Molecular Case Matching: Advance methods for propensity score and molecular matching to create real-world case series that can act as comparators to single-arm trials, improving the precision and speed of efficacy signal generation.

4. Randomized-in-Registry Trials: Implement a federated, pragmatic Phase IIb randomized design within the registry framework, addressing molecular confounding for robust comparative analyses.

5. Rare Patient Screening Tools: Develop automated systems to match biomarkered patients to trials, using harmonized molecular and clinical criteria for streamlined, scalable trial recruitment.

3 Expected impacts to be achieved by your idea

Briefly describe the expected impacts to be achieved by your idea, ensuring that they contribute to IHI general and relevant specific objectives, as described in the IHI SRIA:

Impacts *are wider long-term effects on society (including the environment), the economy and science, enabled by the outcomes of R&I investments. Impacts generally occur sometime after the end of the project, e.g. successful implementation of digital solutions supporting people-centred care.*

IHI general objectives: *1. contribute towards the creation of an EU-wide health research and innovation ecosystem that facilitates translation of scientific knowledge into innovations, notably by launching at least 30 large-scale, cross-sectoral projects, focussing on health innovations; 2. foster the development of safe, effective, people-centred and cost-effective innovations that respond to strategic unmet public health needs, by exhibiting, in at least 5 examples, the feasibility of integrating health care products or services, with demonstrated suitability for uptake by health care systems. The related projects should address the prevention, diagnosis, treatment and/or management of diseases affecting the EU population, including contribution to 'Europe's Beating Cancer Plan'; 3. drive cross-sectoral health innovation for a globally competitive European health industry and contribute to reaching the objectives of the new Industrial Strategy for Europe and the Pharmaceutical Strategy for Europe.*

• Accelerate Europe's Beating Cancer Plan: Develop an automated, open-standard clinical cancer registry that reduces health inequalities by ensuring equitable access to precision oncology clinical insights.

• Enhance Attractiveness for Precision Oncology Trials: Pilot innovative methodologies to improve Europe's competitiveness in precision oncology next indication trials, thereby attracting inbound investment that creates high-value jobs and stimulates economic growth.

• Showcase for EHDS: Create a citizen-relevant showcase within the Cancer Mission that aligns with the European Health Data Space, demonstrating the effective use of federated hospital data for enhanced cancer care and research.

• Build Comprehensive Molecular-Clinical Datasets: Establish large-scale molecular and clinical datasets that leverage routine data and advanced privacy-conserving technologies, powering European discovery research while ensuring patient privacy.

• Catalyse the Health Data Industrial Ecosystem: Facilitate the creation of digital standards and pilot initiatives that can be scaled by national efforts, thus strengthening Europe's health data industrial ecosystem and supporting cross-sectoral collaboration.

4 Why should your idea become an IHI call topic?

Explain why collaboration through a cross-sectoral and multidisciplinary public private partnership is needed in particular:

Why does it require collaboration among several industry sectors (*e.g.* pharma, vaccines, biotech, medical devices, in vitro diagnostics, radiotherapy, medical imaging health ICT)?

Why does it require collaboration between private (industry) and public partners (*e.g.* academia, healthcare practitioners, patients, regulators)?

This initiative is fundamentally cross-sectoral and multi-disciplinary, necessitating collaboration among various stakeholders:

• Pharmaceutical companies must provide targeted drugs and address next-indication evidence needs to develop effective platform trial and registry designs, thereby mitigating risks associated with expanding indications.

• Molecular diagnostic leaders are essential to establish privacy-conserving data standards for routine molecular data, ensuring integration into standard workflows with careful test-to-test

normalisation to account for variations in biomarker coverage.

- Radiology companies and academic AI experts need to collaborate in developing open-source core radiographic outcome assessment tools that can be integrated into solutions across all vendors.

- National informatics initiatives in Europe should align on pragmatic registry solutions and advanced informatics frameworks to streamline data sharing.

- Academic experts in pragmatic trial design are crucial to conceptualising a pharma-neutral platform trial model for the future.

- Engagement with patient groups is vital to ensure that design trade-offs prioritise citizen-centric outcomes and address public health needs.

Why is the contribution of industry needed to achieve the expected impacts?

***Contribution of industry**: Large companies that are members of the IHI industry partners (i.e. COCIR, EFPIA, EuropaBio, MedTech Europe, Vaccines Europe) contribute to the programme, primarily through 'in-kind' contributions (e.g. their researchers' time, laboratories, data, compounds). At least 45% of each project's total costs have to be in-kind contribution.*

While an academic prototype could be developed in isolation, achieving scalability and impact necessitates significant industry collaboration. The involvement of industry stakeholders is critical for the following reasons:

- Pharmaceutical companies must perceive that the solutions provide substantial benefits, incentivising them to supply research-use drugs at scale for pilot studies and to invest in scaling the concept post-validation.

- Molecular diagnostic firms are essential for integrating linkage technologies into their bioinformatics suites, ensuring accessibility for their diverse clientele and enhancing routine trial matching capabilities.

- A dynamic multi-vendor ecosystem of system integrators is vital for the successful implementation of digital registries in hospitals, similar to the EHDEN initiative with OMOP.

- The radiological outcome assessment tools developed must be validated and deemed scalable by imaging vendors, ensuring broad adoption.

Ultimately, demonstrating that the integrated system generates tangible value will be crucial, proving that the whole is greater than the sum of its parts.