

All information regarding future IHI Call topics is indicative and subject to change. Final information about future IHI Calls will be communicated after approval by the IHI Governing Board.

Topic 2: User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

Expected outcomes

Actions under this topic must contribute to at least three of the following outcomes:

- Healthcare professionals will benefit from assistive technologies that are user-centric, and improved workflows within the hospital setting, resulting in optimised procedures or new capacities, while easing the workload and promoting job satisfaction.
- European healthcare systems will benefit from the automation and improvement of already-existing processes and/or the availability of new technologies. These innovations will provide increased functionality or new capacities.
- Patients will benefit from an improved experience throughout the entire care journey, including increased quality and efficiency of healthcare services derived from the automation or improvement of existing hospital workflows, and/or access to novel treatment modalities.
- Healthcare providers will benefit from new and innovative workflows and/or capabilities for improved cost-effectiveness and efficiency of care delivery, enhancing access to care, and improving the experience of both hospital staff and patients.

Scope

Due to long-lasting staff shortages and systemic challenges in healthcare systems, which have been exacerbated as a consequence of the COVID-19 pandemic, healthcare professionals are facing increasing workloads and pressures at work, resulting in an increase in burnout and stress as well as short- or long-term absences from work. A high level of clinician and medical staff burnout has many professional ramifications and can result in medical errors and suboptimal patient care as well.

Technical and data-driven solutions have the potential to support the healthcare workforce, but their adoption has faced many challenges such as: a lack of holistic integration in clinical workflows; a lack of proper consideration of the healthcare professionals' input for their design [1][2][3]; the need to enhance the digital skills of health professionals without adding more workload; the lack of real added value for addressing clinically significant problems; and the under- or over- reliance on artificial intelligence (AI) that may compromise clinical outcomes. For example, while the massive growth in medical data and developments in data analytic methods promise better quality of care and health outcomes for patients at a lower cost for health systems, it also fuels the workload of healthcare professionals, due to the high training and documentation burden for clinicians among other things. Similarly, robot-assisted and automation technologies can improve the safety, quality and efficiency of hospital workflows, such as in surgery and other care settings. However, reconciling the tensions that exist between standardisation through automation versus the unpredictable nature of healthcare work remains difficult. In addition, while AI solutions have been suggested to support clinical decision-making, operational optimisation, patient empowerment, healthy lifestyle maintenance and population health management, they require further testing and validation.

The life-critical decision-making in healthcare and the dynamic, stressful work environment require user-centred (that consider the needs, preferences, and experiences of the healthcare workforce) and intuitive tools that support clinicians with reliable diagnostics and planning, as well as the delivery of complex interventions. In addition, better integration of existing solutions and emerging technologies

in (optimised) hospital workflows will improve treatment outcomes, ease workloads, and preserve job satisfaction.

The projects funded under this topic should develop or improve innovative medical technology solutions. Through collaborative design approaches incorporating the feedback of end-users, the solutions should be easy-to-use, clearly identify and tackle any ethical concerns, and aim to be ready for integration into real-world hospital environments. Applicants should also consider the ethical and societal implications of the proposed solutions, involving the perspectives and preferences of patients and their families as the ultimate beneficiaries.

To achieve this aim, applicants must assemble a public-private partnership to ensure successful co-creation of the proposed solution(s), with input of all relevant stakeholders including healthcare professionals and patients, focusing on the following activities.

- Develop and implement solutions to empower the healthcare workforce (for example in diagnostics, management and organisation, planning, delivery of complex interventions, etc.), by supporting and assisting them without introducing additional burdens.
 - Propose solutions (up to a prototype level) that may relate either to the automation of existing workflows, or the adoption and the integration of new capacities and/or the development of trustworthy and autonomous technologies or technology (AI)¹ experiences.
 - These solutions should be data-driven, aiming to improve workflows and assist clinical procedures and/or hospital processes, supporting in planning and creating a more efficient and balanced supply and demand between patient load and staff competencies and healthcare resource consumption.
 - Applicants should take into consideration standardised approaches to data acquisition to allow proper development/training of the technologies.
- Propose and implement a strategy for better integration of existing and/or emerging technologies in different hospital workflows. This may include an analysis of the most critical processes running in hospitals, technological gaps within the hospital environment, ways to optimise workflow(s), and a roadmap of how the proposed technologies can grow, adapt, and innovate to meet the future needs of a healthcare system and its staff.
- Demonstrate potential for deployment through use cases that address wide user groups involving all relevant medical staff categories (nurses, medical staff, specialists, managers, etc.).
- Establish effective training approaches for complex technologies to minimise user burden and operator error, and/or to improve patient outcomes.
- Convincingly demonstrate the scalability and transferability of the approaches across different healthcare professions and different levels of care.
- Demonstrate the feasibility and desirability of the proposed approach(es) or technologies from an economic perspective, analysing the potential impact on patient and staff costs in healthcare institutions, payers, insurers, and on the healthcare system. Applicants should consider relevant strategies to drive end-user and organisation-wide adoption.
- Where relevant, the proposed solutions should aim at developing and applying relevant standards (i.e. Fast Health Interoperability Resources (FHIR), Health Level Seven International (HL7), Integrating the Healthcare Enterprise (IHE), Logical Observation Identifiers Names and Codes (LOINC), Systemized Nomenclature of Medicine – Clinical Terms (SNOMED CT),

¹ If applicable to the proposal, the consortium should consider relevant initiatives on the safe use of AI in the healthcare domain, including references to ISO/SC42, ISO/TC215, and AI4Health.

Business Process Model and Notation (BPMN)) and ensuring the potential for regulatory approval, taking into consideration the different national regulatory requirements to ensure future implementation in the target markets.

- If relevant, applicants should take into account other dimensions with regulatory implications (for example the prevention and management of shortages, implementation of risk minimisation measures following regulatory decisions, the incorporation of clinical trial design requirements, and collecting real world data (RWD) for regulatory purposes).
- Where applicable, applicants should ensure the proposed solutions take into consideration supporting the secondary use of data generated for research, including by regulators.
- Applicants should also learn from past EU-funded projects (via mapping exercises and desk reviews) and reserve resources to synergise with other relevant ongoing initiatives. These could include other projects funded under this topic, those funded under IHI Call 3², and 'AI for the smart hospital of the future' (DT-ICT-12-2020) or HORIZON-HLTH-2023-CARE-04-02, if relevant.

Expected impacts

Actions under this topic are expected to achieve the following impacts and contribute to the following EU policies/initiatives:

- development of innovative medical technology that directly contributes to halting the current efflux of medical professionals, fostering sustainable careers in healthcare, and potentially improving clinical outcomes;
- improved patient care through advanced diagnostic and treatment technologies and more efficient clinical workflows, while ensuring the privacy and security of patient data;
- companies develop and offer advanced technological solutions to support healthcare professionals; these solutions should consider workflow integration and reflect end-user needs;
- healthcare systems could improve their capacity and resilience because of more efficient and sustainable solutions.

Actions are also expected to contribute to the following EU policies/initiatives:

- contribute to the 'Comprehensive Approach to Mental Health' of the European Commission by promoting the reduction of psychosocial risks at work in the healthcare sector, and 'a Europe fit for the digital age', by empowering people with a new generation of technologies.

Why the expected outcomes can only be achieved by an IHI JU action

Other programmes have previously addressed human-technology interactions in a broad manner, however, IHI JU is best suited to structurally address the specific needs of the healthcare sector. For the successful embedding of technologies in the work of people in healthcare, collaboration between private and public organisations is a basic prerequisite for implementation. This topic, in particular, requires cross-sectoral approaches involving the med-tech and pharmaceutical industries for the effective integration of new technologies in the clinical workflow. Moreover, it is essential to bring together broad user groups involving all relevant medical staff categories (nurses, medical staff, specialists, pharmacists, etc.) with industry partners to ensure the upfront integration of their input.

² <https://www.ihj.europa.eu/apply-funding/ihj-call-3>

In addition, a multidisciplinary approach is needed to enable an objective and qualified evaluation of the proposed novel medical technologies, integrating the social sciences and humanities to understand the user preferences and expectations, and ensure acceptance and uptake among users. Where relevant, the evaluation of ethical and technical safety risks may require collaboration with ethicists and regulators.

Indicative budget

Applicant consortia will be competing for the maximum financial contribution from IHI JU of up to EUR 25 000 000.

IHI JU estimates that an IHI JU financial contribution of EUR 12 500 000 would allow a proposal to address these outcomes appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Applicant consortia must ensure that at least 45 % of the action's eligible costs and costs for the action-related additional activities are provided by in-kind contributions to operational activities ('IKOP'), financial contributions ('FC's), or in-kind contributions to additional activities ('IKAA'). While 45 % is the threshold for eligibility, applicant consortia are strongly advised to aim for 50 % to provide a margin e.g. for unforeseen changes during the project lifetime.

IKOP and FCs may be contributed by the constituent and affiliated entities of both the private members and the contributing partners. IKAA may be contributed by constituent and affiliated entities of the private members only. Contributing partners and their affiliated entities cannot contribute IKAA. See the call conditions in the annual Work Programme for further information (also in the document "call text" published on the IHI website).

Indicative duration of the actions

Applicants should propose a project duration that matches the project's activities and expected outcomes and impacts.

Dissemination and exploitation obligations

The specific obligations described in the conditions of the calls and call management rules under 'Specific conditions on availability, accessibility and affordability' apply.

References

- [1] Collier, R., Medical technology often a burden if designed without physician input. Canadian Medical Association Journal, E1091–E1092. 2018.
- [2] Lena Petersson et al., Challenges to implementing artificial intelligence in healthcare: a qualitative interview study with healthcare leaders in Sweden, BMC Health Services Research, 2022.
- [3] Schlieter H et al., Scale-up of Digital Innovations in Health Care: Expert Commentary on Enablers and Barriers, Journal of Medical Internet Research, 2022.