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Health Labs4Value

D.2.4.2 Jointly developed final territorial action plans of territorial Health Labs4Value Czech Republic

1. Executive summary

The Health Labs4Value (HL4V) Action Plan is a three-year strategic initiative aimed at improving healthcare in the Czech Republic by promoting innovation, optimising care processes and strengthening international cooperation. The plan addresses critical challenges such as system inefficiencies, the need for digital transformation and the growing demand for patient-centred, co-created care by embedding practical, proven methods that link hospital and home settings and enable solutions to be used in everyday practice.

The Action Plan sets out the strategic objectives and actions of the Czech project partners for their active participation in Health Labs4Value from 2026 to 2029. In line with the initiative's goals, the plan prioritises Living Lab approaches, rapid testing in real environments and the transfer of knowledge across regions. This ensures that only solutions offering clear value to patients, caregivers and clinicians are scaled up. A structured timetable, light-touch indicators and regular reviews will ensure focused, measurable progress while building a sustainable, patient-centred innovation ecosystem.

Purpose and scope

At its core, this plan aims to realign national health priorities with the ambitious goals of the Health Labs4Value initiative. By fostering a culture of innovation and collaboration, it aims to improve service quality, optimise healthcare processes and promote a digitally transformed, patient-centred system. The three-year timeframe (2026–2029) allows for the achievement of specific, measurable goals, with methods and lessons shared internationally for reuse by others.
To achieve these improvements, we are focusing on the following key objectives:

- Patient-centred, digitally enabled care pathways from hospital to home.
- Co-creation and collaboration between providers, patients, academia and SMEs using a Living Lab approach.
- Sharing knowledge and transferring technology to replicate successful practices across regions.
- Workforce upskilling and supportive policies/funding to sustain prevention, adoption and scaling up.

To translate these objectives into practice, the action plan sets out a structured programme of activities with defined timelines, milestones, resource needs, expected impacts, and clear outcome indicators. Activities follow a Living Lab logic—design with users, test in real settings, and integrate only what fits clinical workflows and everyday

life at home—so that innovation moves from concept to routine use in a controlled, evidence-informed way.

The plan also defines a coherent stakeholder framework. Roles and responsibilities are specified for healthcare providers, policymakers, researchers, SMEs, universities, and patient organisations, together with expected levels of engagement across co-creation, testing, evaluation, and scale-up.

Monitoring, learning, and risk management are embedded from the outset. Each activity includes lean indicators and review points to track progress, surface issues early, and adjust course. This disciplined, collaborative approach provides the operational backbone for the chapters that follow, where individual actions are detailed.

2. Introduction

2.1. Brief overview of Health Labs4Value initiative

The Health Labs4Value initiative is aimed at improving healthcare systems across Central Europe through innovation, collaboration, and knowledge sharing.

Vision and mission: The initiative seeks to create an innovative and sustainable healthcare ecosystem across Central Europe by fostering collaboration among academia, healthcare providers, start-ups, industry leaders, and public institutions.

Geographical scope: The project encompasses six Central European countries: Austria, Czech Republic, Germany, Hungary, Poland and Slovenia.

Key approach: Health Labs4Value utilizes a "Living Labs" methodology, establishing decentralized hubs in each participating country for testing and validating healthcare innovations in real-world settings. These Living Labs are designed as user-centred, open innovation ecosystems, integrating research and innovation processes with the everyday lives of citizens. This allows for innovations to be developed and tested collaboratively, ensuring they are relevant, accessible, and meet the real-world needs of both healthcare providers and patients. By operating within diverse community settings, these Living Labs offer a flexible and adaptable approach to healthcare innovation, fostering rapid prototyping, user feedback integration, and the scaling of successful solutions.

2.2. Purpose and scope of the action plan

This action plan outlines the Czech Republic's strategic objectives and specific actions to actively participate in and benefit from the Health Labs4Value initiative. The plan focuses on fostering collaboration among stakeholders, including healthcare providers, research institutions, and policymakers, to create a sustainable healthcare innovation ecosystem. The scope of this plan encompasses the Czech Republic's healthcare system, including hospitals, research institutions, universities, and relevant government agencies. The plan

aims to contribute to the broader goals of the Health Labs4Value initiative by promoting knowledge sharing, technology transfer, and the development of innovative healthcare solutions.

3. Local context analysis

3.1. Current healthcare landscape

The Czech Republic operates a social health insurance system with universal coverage. This system is financed mainly through compulsory contributions and is administered by several public health insurance funds, with VZP (General Health insurance company) being the largest. Healthcare is provided by a mix of public and private providers, and patients typically access specialists via referrals from their general practitioner (GP).

The country has a well-developed network of hospitals, clinics and primary care facilities, ensuring that healthcare services are accessible to the majority of the population.

Financing and delivery

Health services are predominantly financed by compulsory insurance contributions and state payments for selected population groups. Providers are a mix of public and private entities operating within a regulated contractual framework (European Observatory on Health Systems and Policies, 2023). Public-sector spending on health accounts for a significant proportion of general government expenditure, reflecting the system's principle of solidarity (Eurostat, 2025).

Population needs and outcomes

Like many other EU countries, the Czech Republic is experiencing population ageing and an increasing prevalence of chronic conditions. This is leading to a greater demand for continuous, well-coordinated care and prevention (European Observatory on Health Systems and Policies, 2021). Healthy life expectancy indicators and related EU monitoring highlight the importance of prevention and rehabilitation in extending the number of years lived in good health (Eurostat, 2024).

System performance and gaps

National and EU health profiles indicate progress in coverage and access. However, they also highlight regional disparities and gaps in care coordination at transitions between hospital and home settings. These are areas where digital tools and clearer pathways could be beneficial (European Observatory on Health Systems and Policies, 2021; OECD/European Observatory, 2023).

Digital transformation

The country's Digital Decade 2030 strategy prioritises the secure use of data, interoperability, and citizen-facing services. This creates a policy environment in which patient-centred digital health solutions that fit routine workflows can flourish (Government of the Czech Republic, 2024).

The national statistical capacity (ÚZIS) provides the data backbone for monitoring and planning across the health sector (ÚZIS, n.d.).

3.2. Key challenges and opportunities

Key challenges

- **Research-to-practice translation gap**: Academic research often fails to translate into practical applications in clinical settings. System reviews highlight the need for greater use of data and innovation, as well as a stronger link between research outputs and everyday care. They also suggest that the transition from pilot schemes to routine practice could be improved.
- **The rapid population ageing and the chronic disease burden**: The age structure in the Czech Republic is changing, with an increasing number of people suffering from multiple chronic conditions, which is putting sustained pressure on hospitals, long-term care and primary care (OECD/WHO, 2023).
- **Pressures on the health workforce and uneven distribution**: Persistent shortages, especially in nursing and primary care, and uneven distribution, hamper access to healthcare outside the largest cities (OECD/WHO, 2023).
- **Hospital-centric care and avoidable admissions:** Indicators for ambulatory-care-sensitive conditions suggest that prevention and community/primary care could be strengthened to reduce unnecessary hospital use (OECD/WHO, 2023; OECD, 2023).
- **Digitalisation/innovation bottlenecks**: The translation of research into routine care is uneven, funding for digital health is fragmented, and past eHealth programmes have suffered from delivery issues. The adoption of advanced technology, such as AI, is slowed by capacity and interoperability gaps (NKÚ, 2023; OECD/WHO, 2023; European Commission, 2023).

Key opportunities

- **Universal coverage and solid provider network as a platform** for patient-centred reforms and digital care pathways (OECD/WHO, 2023).
- **Momentum for primary-care strengthening and integrated care models** to reduce avoidable hospital use (OECD/WHO, 2023; OECD, 2023).
- **Building blocks for digital health** (e.g. e-prescription and expanded teleconsultations) that can be scaled up with better governance and interoperability (OECD/WHO, 2023).
- **Transnational collaboration and EU funding** can accelerate the transfer, evaluation and scaling up of proven innovations (European Commission, 2024/2023).
- **Growing innovation performance** - Czechia remains a moderate innovator but continues to improve its position on the European Innovation Scoreboard, providing a foundation for stronger health innovation pipelines (EC/EIS, 2024).

3.3. SWOT analysis

Strengths:

- Universal health coverage and a well-developed healthcare infrastructure.
- Strong research capabilities in medical technologies, digital health, and related fields.
- Government commitment to healthcare innovation and modernization.

Weaknesses:

- Limited funding for healthcare innovation and technology transfer.
- Regulatory barriers and lengthy approval processes for new technologies.
- Fragmentation of the research environment and limited collaboration among stakeholders.

Opportunities:

- Transnational cooperation and knowledge sharing within the Health Labs4Value initiative.
- Advancements in digital health and potential for improving healthcare delivery.
- Growing awareness of the importance of preventive healthcare and patient-centered care.

Threats:

- Aging population and increasing prevalence of chronic diseases.
- Potential resistance to change and adoption of new technologies.
- Limited workforce capacity and skills gaps in digital health and innovation.

4. Pilot experience

4.1. Brief summary of the pilot activity (1500 characters)

The pilot activity took place at Liberec Regional Hospital. The aim was to co-create and test a digital solution (Rovinka) to support the long-term aftercare of patients with spinal cord injuries. The application was developed using a Living Lab approach that involved patients, hospital staff, carers, university researchers and the developer working together. The goal was to provide SCI patients with the necessary tools and guidance for rehabilitation and preventing complications once they were discharged from hospital. Key elements included regular physical exercise, pressure ulcer prevention and structured check-ins, with the aim of supporting patients' independence and quality of life at home. The pilot tested the functionality, usability and engagement potential of the solution in several iterations. As well as the digital tool itself, the pilot demonstrated that hospitals could act as agile co-innovation environments by integrating patient feedback and everyday clinical practice into development cycles.

4.2. Experience gained from the pilot activity (1000 characters)

The pilot demonstrated that opening up to co-creation can lead to more effective tools and a cultural shift. Clinicians valued the practical relevance of tools built with their input. Patients appreciated being asked what they needed and having their responses reflected in the final product. The process fostered trust between stakeholders, bridging the gap between technology and healthcare and helping everyone involved to better understand SCI aftercare needs. At the same time, the pilot revealed the importance of keeping solutions simple, flexible and based on real-life experiences. A key takeaway was the importance of validating every idea with end users rather than relying on assumptions or 'expert' top-down input.

4.3. Impact of the pilot activity on the action plan

The pilot provided valuable insights that informed the structure and direction of this Action Plan, demonstrating the feasibility and effectiveness of the Living Lab model in Czech healthcare settings. Our strategic goal to promote bottom-up innovation and foster closer cooperation between hospitals, developers, patients and universities has been

shaped by the experience from Liberec. This requires dedicated support for small-scale pilot projects and greater flexibility in funding and regulations. Therefore, sustaining and expanding the outcomes of the pilot is an integral part of this Action Plan.

The next steps involve the spinal unit and the rehabilitation pathway. In collaboration with the Liberec spinal unit, we will continue to develop and prepare for the wider introduction of the new solution. Over the next few months, we will introduce Rovinka to rehabilitation centres that regularly treat patients with spinal cord injuries (SCIs) as part of their care pathway. These centres can help raise awareness and expand the pool of users and testers. Through ongoing communication, they can also become active co-creation partners in this project and in future cooperation and co-creation projects involving other solutions. This will enable us to evaluate each centre's willingness to collaborate in future and lay the groundwork for a wider rollout.

As part of this action plan, we intend to maintain and further develop the living lab and value-based healthcare approach. One concrete activity that could be undertaken as a first step is the expansion of the Living Lab concept to other departments within the hospital, where this co-creation approach, enriched with feedback, can be adapted to different workflows. This activity is planned as the next future step in order to validate scalability and build momentum for a national rollout.

5. Strategic objectives and priorities

5.1. Localised priorities based on regional needs

The following priorities transform the findings of the local context analysis into a practical roadmap for the next three years. They address the most pressing needs of the Czech healthcare system: closing the gap between hospital and home care, embedding patient-centred Living Lab co-creation and enabling safe, interoperable digital tools that fit real workflows. Each priority includes specific actions that are easy to implement, can be measured in everyday settings and are designed for reuse by other sites, so that proven solutions can be adopted as standard practice and implemented across regions.

1. **Make patient-centred Living Lab co-creation the new norm -** Bridge the research-to-practice gap by developing solutions with users, not just for them. Each new idea should pass through short Living Lab cycles on real wards and in homes. Clinicians, patients, caregivers, technologists and managers should co-create, test and refine the idea until it fits everyday routines (Quadruple Helix).
2. **Strengthen the hospital-to-home continuum and prevention measures** - Focus on providing practical tools to make discharge education clearer and self-management at home easier, such as rehabilitation plans, pressure ulcer prevention strategies, and simple checklists and reminders. The aim is to reduce avoidable readmissions and increase patient confidence.

3. **Implement enabling data, interoperability and proportionate regulation** - Establish the fundamental building blocks that enable the safe scaling of digital tools: straightforward consent models, basic data standards, interoperability with existing systems, and proportionate testing regulations.
4. **Grow people and capabilities in digital health and innovation** - Close the skills gap by providing short, practical training for clinicians, managers and IT professionals, and by forming university partnerships.
5. **Secure sustainable funding and practical procurement routes** - Move beyond one-off grants by combining EU and national programmes with small hospital seed budgets, outcome-oriented procurement, and targeted PPPs.
6. **Reduce regional inequalities by sharing knowledge** - Share successful practices so that smaller or remote providers can adopt them without having to start from scratch.
7. **Improving regulatory frameworks for technology adoption** - This priority aims to address the regulatory barriers hindering the adoption of new technologies by advocating for clearer guidelines, streamlined approval processes, and the establishment of regulatory sandboxes. This will involve collaborating with policymakers and regulatory bodies to create a more supportive environment for healthcare innovation.
8. **Developing workforce capabilities in digital health and innovation -** To address the skills gaps and limited workforce capacity, this priority focuses on upskilling healthcare professionals and technical experts in digital health and innovation. This will involve organizing training programs, workshops, and knowledge-sharing initiatives to enhance the capacity to adopt and implement new technologies.

5.2. Alignment with Health Labs4Value strategic objectives

The priorities set for the Czech Republic directly support the core ambitions of Health Labs4Value (HL4V). The table-free mapping below illustrates how each priority contributes to HL4V's objectives and the importance of scaling up across Central Europe.

- **Foster cross-sector, patient-centred collaboration**

The HL4V goal: co-creation with users and multi-stakeholder engagement.

Aligned priorities: P1: Make patient-centred Living Lab co-creation the new norm.

P6: Reduce regional inequalities by sharing knowledge.

How it aligns: Short Living Lab cycles on real wards and at home embed the Quadruple Helix (patients/caregivers, clinicians, technologists and managers) from day one. This produces solutions that fit daily routines and can be reused by other sites.

- **Close the hospital-to-home gap and promote value-based preventive care**

The HL4V goal: Improve outcomes that matter to patients while using resources wisely.

Aligned priorities: P2: Strengthen the hospital-to-home continuum and prevention measures.

How it aligns: Providing practical tools for discharge education, home rehabilitation and pressure ulcer prevention reduces avoidable readmissions and increases patient confidence — clear, value-based wins.

- **Promote knowledge sharing and technology transfer**

The HL4V goal: Spread effective practices across regions and avoid creating isolated "pilot islands".

Aligned priorities: P1: Living Lab co-creation; P6: Knowledge sharing to reduce inequalities.

How it aligns: Documented playbooks, content bundles and governance templates enable smaller or remote providers to adopt proven methods without having to start from scratch.

- **Enable digital health, interoperability and proportionate regulation**

The HL4V goal: Create conditions for safe and scalable digital solutions.

Aligned priorities: P3: Enabling data, interoperability and proportionate regulation; P7: Improving regulatory frameworks for technology adoption.

How it aligns: Clear consent models, baseline data standards, basic interoperability with existing systems, and regulatory sandboxes reduce the risk and cost of testing and scaling up.

- **Build workforce capacity for innovation**

The HL4V goal: Equip staff with the skills to adopt and sustain change.

Aligned priorities: P4: Grow people and capabilities in digital health and innovation.

P8: Develop workforce capabilities.

How it aligns: Short, practical training and university partnerships help clinicians, managers, and IT teams to use and maintain digital tools confidently in routine care.

- **Secure sustainable financing and procurement pathways**

The HL4V goal: Move from one-off pilots to durable adoption.

Aligned priorities: P5: Sustainable funding and practical procurement routes.

How it aligns: Combining EU/national funds with small hospital seed budgets, outcome-oriented procurement and targeted PPPs creates a predictable pathway from pilot to service.

- **Scale what works across Central Europe**

The HL4V goal: replicate impact, not just software.

Aligned priorities: P1–P6 (bundle).

How it aligns: The emphasis on reusable methods (Living Lab cycles, shared templates and light data standards) means that solutions can be adapted to different hospital workflows, regions and regulatory contexts, all the while keeping patient value at the centre.

By aligning its local priorities with the overarching goals of the Health Labs4Value initiative, the Czech Republic aims to actively contribute to the creation of a sustainable and innovative healthcare ecosystem across Europe.

6. Proposed activities and interventions

6.1. Activities to support the implementation of Priority 1: Strengthening the connection between research and practice

6.1.1. Activity 1: Establish a pilot project to test and implement an innovative healthcare solution

Description:

This activity involves selecting and implementing a pilot project that addresses a specific healthcare challenge in the Czech Republic, utilizing innovative technologies or methodologies. The project will be conducted in a real-world setting, allowing for the evaluation of its feasibility, effectiveness, and potential for wider adoption.

- **Timeline and milestones:**
    - Year 1: Selection of pilot project and development of implementation plan.

- Year 2: Implementation of pilot project and ongoing monitoring.
- Year 3: Evaluation of pilot project outcomes and dissemination of findings.

- **Resource requirements**
  - Human resources: Project manager, research team, healthcare professionals.
  - Financial resources: Funding for technology acquisition, personnel costs, and operational expenses.
  - Technological resources: Access to relevant technologies and infrastructure.

- **Expected outcomes and impact**
  - Successful implementation of the pilot project and demonstration of its effectiveness in addressing the selected health challenge.
  - Generate evidence and best practice for wider adoption of the innovative solution.
  - Contribution to the Health Labs4Value goal of fostering regional and international innovation ecosystems.

- **Key Performance Indicators (KPIs)**
  - Achievement of project milestones on time and within budget.
  - Effectiveness of the innovative solution in addressing the healthcare challenge.
  - Number of healthcare professionals trained in the new technology or methodology.
  - Dissemination of project results through publications and presentations.

6.1.2. Activity 2: Maintain and expand the pilot solution

Description:

This activity maintains and iteratively improves upon the solution created in HL4V, i.e. the digital solution for spinal cord injury patients and the Living Lab co-creation method behind it. It formalises onboarding and quarterly feedback loops at the pilot hospital and deeply introduces the solution and method to one or two rehabilitation centres that routinely work with SCI patients. The focus is on light real-world monitoring, quick fixes

and producing reusable implementation materials such as a short playbook, consent templates, staff one-pagers and a quick-start card.

- **Maintenance**

A small maintenance team led by the SME, in partnership with the hospital, keeps the digital solution content updated and provides basic technical support. The team also prioritises changes raised by patients, carers, staff and other potential end users. University and innovation hub partners provide ad hoc facilitation and documentation.

- **Timeline and milestones**
  - Months 1–3: Set up a maintenance team, agree on the process for handling change requests, and finalise the onboarding process (≤5 minutes) and the quick-start card.
  - Months 4–12: Run quarterly feedback loops, onboard one rehabilitation centre or other relevant facility or department and publish Implementation Guideline
  - Year 2: Onboard one additional rehabilitation centre or other relevant facility or department and hold one cross-site learning workshop. Publish Guideline – updated after first year real-world testing results (including refined consent forms and staff tips).
  - Year 3: Conduct an external peer review of multi-site use and prepare a Scale-up Brief detailing costs, procurement routes and data/interoperability minimums.
- **Resource requirements**
  - Human resources:
    - SME: product owner, software developer(s), UX/UI designer, support desk
    - Hospital: clinical department, project manager, nurse/staff educator, IT/data liaison
    - Partners: facilitator/documenter from university/innovation hub
  - Financial resources:
    - Development and maintenance budget, content update, video refresh, travel, evaluation
    - Potential funding mix: TA ČR, OP TAK, Interreg CE follow-on, Horizon Europe, hospital/facility seed budges, insurer prevention funds, foundations

- Technical resources:
  - Stable hosting; simple content-management workflows; basic analytics export (privacy preserving); data dictionary + consent model; no heavy EHR integration required in this phase

- **Expected outcomes and impact**
  - Clearer discharge education and easier home routines will encourage sustained use at the origin site, with the focus on rehabilitation, physiotherapy and pressure-ulcer prevention.
  - A broader reach, supporting more patients and caregivers with a single, consistent source of guidance.
  - A reusable guidance will allow other Czech sites to adopt the method without starting from scratch, thereby strengthening patient-centred approach.
- **Key performance indicators (KPIs)**
  - The number of eligible SCI patients introduced to the tool during their inpatient stay.
  - Percentage of discharged SCI patients who received bedside onboarding (trend over time).
  - The number of caregivers/relatives who were briefed alongside the patient.
  - The number of participating sites using the same onboarding workflow.
  - Patients are asked to report on the ease with which they can follow daily routines.
  - Staff report on the clarity of the discharge script and the perceived reduction in repeated explanations using a brief debrief form.
  - The number of content updates released per year.
  - Monthly internal check; trend emphasized over point estimates.

6.1.3. Activity 3: Create a knowledge-sharing platform to facilitate the exchange of best practices and research findings

Description:

This activity involves the development of an online platform or network to facilitate the exchange of knowledge, best practices and research results related to healthcare innovation. The platform will connect researchers, healthcare providers and other stakeholders to enable collaboration and dissemination of information.

- **Timeline and milestones**
  - Year 1: Development and launch of the knowledge exchange platform.
  - Year 2: Population of the platform with relevant content and promotion of its use among stakeholders.
  - Year 3: Evaluate the use of the platform and its impact on knowledge sharing and collaboration.

- **Resource requirements**
  - Human resources: Platform manager, content curators, IT support.
  - Financial resources: Platform development and maintenance costs.
  - Technological resources: Secure and user-friendly online platform with relevant features.

- **Expected outcomes and impacts**
  - Increased awareness and adoption of best practice in healthcare innovation.
  - Enhanced collaboration between stakeholders and accelerated translation of research into practice.
  - Contribute to the Health Labs4Value goal of advancing digital health solutions and streamlining technology adoption.

- **Key Performance Indicators (KPIs)**
  - Number of registered users on the platform.
  - Frequency of content updates and user engagement.
  - Number of collaborations initiated through the platform.
  - User satisfaction with platform features and content.

6.2. Activities to support the implementation of Priority 2: Enhancing funding mechanisms for healthcare innovation

6.2.1. Activity 1: Develop and implement a public-private partnership (PPP) model for funding healthcare innovation projects

Description:

This activity involves exploring and implementing a PPP model to leverage private sector investment in healthcare innovation. The PPP will bring together public and private sector partners to co-fund and implement innovative projects, sharing risks and rewards.

- **Timeline and milestones**
  - Year 1: Identification of potential PPP partners and development of a PPP framework.
  - Year 2: Launch of a pilot PPP project and ongoing monitoring of its performance.
  - Year 3: Evaluation of the PPP model's effectiveness and potential for wider application.

- **Resource requirements**
  - Human resources: PPP coordinator, legal and financial experts.
  - Financial resources: Seed funding for the pilot PPP project.
  - Technological resources: Access to relevant data and information for project evaluation.

- **Expected outcomes and impact**
  - Successful implementation of the pilot PPP project and demonstration of its viability.
  - Increased investment in healthcare innovation and diversification of funding sources.
  - Contribution to the Health Labs4Value objective of promoting sustainability in healthcare.

- **Key performance indicators (KPIs)**
  - Amount of private sector investment secured through the PPP.

- Number of innovative projects funded and implemented through the PPP.
- Financial sustainability and return on investment of the PPP model.
- Dissemination of PPP best practices and lessons learned.

7. Collaboration and partnerships

7.1. Identification of key stakeholders

- Ministry of Health of the Czech Republic
- Regional health authorities
- Hospitals and healthcare providers
- Universities and research institutions
- Technology companies and startups
- Patient organizations and advocacy groups
- Innovation Hubs
- International partners within the Health Labs4Value initiative

7.2. Roles and responsibilities

- **Ministry of Health**: Provide policy guidance, regulatory support, and oversight of the action plan implementation; enable regulatory sandboxes; coordinate funding; co-chair the national steering group.
- **Regional health authorities:** Facilitate collaboration among healthcare providers, allocate resources, and monitor progress at the regional level; support pilot sites; track regional KPIs; shared procurement when pilots scale.
- **Hospitals and healthcare providers:** Run Living Lab cycles; appoint a clinical champion and IT/data liaison; embed tools in discharge workflows; ensure GDPR and clinical safety; provide feedback on their effectiveness.
- **Universities and research** institutions: Conduct research, develop innovative technologies, and contribute to knowledge sharing; conduct co-design evaluations; run structured interviews and usability tests; analyse qualitative data; deliver short training sessions; synthesise evidence for scaling up and policy briefs.
- **Technology companies and startups:** Translate requirements into releases, localise content, ensure security and interoperability where applicable, train users and plan sustainable financing and roadmaps. Provide technological solutions, expertise, and investment in innovation projects.

- **Patient organizations:** Advocate for patient needs, provide input on healthcare innovation, and participate in evaluation activities. Recruit and support patient and carer advisors; co-create and review content; lead outreach activities; highlight equity issues; co-author plain-language summaries.
- **International partners:** Provide peer reviews, share templates and playbooks, host cross-border learning and support adaptation to other regulatory contexts. Share knowledge, best practices, and resources, and collaborate on joint projects.
- **Innovation Hubs:** Convene Quadruple-Helix stakeholders and facilitate Living Lab workshops. Run challenge calls or scouting missions to match SMEs with clinical needs. Host or co-manage the knowledge space, providing playbooks, templates and training assets, and organise show-and-tell events to facilitate rapid diffusion. Provide capacity building in the form of short training sessions on patient-centred design, UX and interoperability basics, and connect sites to EDIH services (test-before-invest and digital maturity checks).

7.3. Mechanisms for collaboration

- **National steering committee:** A national steering committee will be established to coordinate activities, facilitate communication, and monitor progress. The committee will include representatives from all key stakeholder groups.
- **Working groups:** Specific working groups will be formed to focus on particular activities or areas of expertise, such as technology adoption, workforce development, or funding mechanisms.
- **Knowledge-sharing platform:** The online platform will serve as a central hub for communication, collaboration, and dissemination of information among stakeholders.
- **Regular meetings and workshops:** Regular meetings and workshops will be organized to facilitate dialogue, share updates, and address challenges.

8. Risk assessment and mitigation strategies

Risk	Probability of occurrence	Mitigation strategy
Lack of stakeholder engagement	Medium	Develop a comprehensive communication and outreach plan to ensure active involvement of all stakeholders
Funding constraints	High	Diversify funding sources, explore public-private partnerships, and seek EU funding opportunities
Regulatory barriers	High	Advocate for clearer guidelines, streamlined approval processes, and the establishment of regulatory sandboxes
Resistance to change	Medium	Provide training and support to healthcare professionals to facilitate the adoption of new technologies and methodologies
Data protection / ethic approvals delays	High	Prepare a complete "approval pack" in advance and appoint a coordinator to liaise with the DPO/ethics committee for rapid feedback. Start pre-submission consultation early.

9. Monitoring and evaluation framework

9.1. KPI tracking methodology

The key performance indicators (KPIs) defined for each activity will be tracked using a combination of quantitative and qualitative data collection methods.

- Quantitative data: This will include numerical data such as the number of pilot projects implemented, the amount of funding secured, the number of participants trained, and website traffic on the knowledge-sharing platform. The quantitative data will be collected through project reports, financial records, and website analytics.
- Qualitative data: This will include information on stakeholder satisfaction, challenges encountered, and lessons learned. The collection of qualitative data will be achieved through the utilisation of surveys, interviews, and focus group discussions with relevant stakeholders.

The frequency of data collection will be contingent on the specific KPI and activity in question. A proportion of KPIs will be subject to monthly tracking, while others will be tracked on a quarterly or annual basis. The national steering committee will assume responsibility for the oversight of the data collection process and the assurance of data quality.

9.2. Reporting mechanisms

Reporting will be straightforward, consistent and based on the Czech pilot context, providing people with the information they need to make decisions, rather than just filing paperwork. A small secretariat, hosted jointly by the Regional Hospital Liberec and the Technical University of Liberec, will produce three documents: a monthly dashboard, a concise quarterly progress report and a fuller annual report. The monthly dashboard will track basic information such as the number of new patients onboarded, staff trained, co-creation sessions held, and issues raised and resolved, and will be circulated to site leads. The quarterly report summarises this information for the National Steering Committee, explaining what is on track or at risk and why, as well as outlining any planned corrective steps. The annual report, approved by the Steering Committee, will be submitted to the HL4V Joint Secretariat and published (in Czech and English) on the project website and the Liberec hospital website.

Each report will cover the same practical areas, enabling trends to be identified over time. These areas include uptake and reach across Czech sites; quality and safety signals drawn from short patient, caregiver and staff debriefs; progress against milestones; budget expenditure versus the plan; and the status of data protection, interoperability and IT changes.

As the focus is on learning rather than just compliance, each quarterly report concludes with one to three specific recommendations for implementation in the subsequent quarter (e.g. refining the bedside onboarding script, adjusting patient information on pressure ulcer prevention, or providing a brief refresher for ward staff). The annual report includes a 'strategy check' that compares progress against the Action Plan's objectives and proposes adjustments for Years 2 and 3. Public summaries are written in plain language, protecting personal data and commercial sensitivities while keeping patient groups and regional partners informed. In this way, reporting becomes a steady feedback loop — from wards and families to management and policy — so the programme stays accountable and continues to improve.

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