ProVaHealth

PRODUCT VALIDATION IN HEALTH

— Policy Recommendations

Interreg
Baltic Sea Region

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TASK DESCRIPTION

Task A2,3 title:
Providing policy recommendations

Work package 2 title:
Living Lab analysis, development tools and monitoring

Responsible Partner:
PP 15 - Upper Silesian Agency for Entrepreneurship and Development Ltd

OBJECTIVE
- Give input for policy making and the development of living labs and quatro helix cooperation at different levels (local, regional, cross-border etc).
- Produce practical guidelines proceeding from the tests of the toolbox carried out with the Living Labs and hands-on approach
- Provide practical advise on how to deal with the implementation of the demand side of innovation and public procurement at home and in various partner countries.
- A sustainable output of the project to be implemented and used after the end of the project

QUATTRO HELIX STAKEHOLDERS

Local and l level stakeholders
Through specific regional round tables, organised in each partner region. Involve all the quatro-helix partners: companies, users, public organisations and researchers.

National level stakeholders
Ministries of Social Affairs and Health. Economic Affairs Committees of Parliaments. Ministries of Economic Affairs. Chambers of Commerce and Industry. National innovation and development related organisations.

Transnational level stakeholders
Such as the organisations of ENoLL and ScanBalt, embassies of the partner countries which can spread the best practice among the industry and other Living Labs;

EU level stakeholders
Such as the European Commission: DG Sante, DG Digit, DG RTD, DG GROW

DOCUMENTATION PREPARED BY:

Beata Krawczyk
project manager in the Consulting, Training and MArketing Department. GAPR Ltd., Poland
bkrawczyk@gapr.pl

Esther Davidsen
EU policy advisor and project developer for the Region of Zealand, Denmark
esther.davidsen@hotmail.com

The objective of the policy recommendations[1] task within work package 2, is described in the project application as:

"To **produce a set of policy recommendations** aimed at the **local, regional, cross-border level, national and international level** which will address the development of **Living Labs and quattro helix collaboration."**

"A set of **practical guidelines** will be devised from use and test of the Living Labs Self Assessment toolbox developed in the project".

"The **implementation of the demand side of innovation and public procurement** is in focus, and the policy recommendations will produce **practical advice** addressing these aspects".

The audience of the ProVaHealth policy recommendations are stakeholders at the regional, national, transnational and EU level.

Methodology: Three workshops and a questionnaire to analyse needs and identify policy recommendations

During the time of the project, the partnership arranged three workshops aimed at identifying the partners' needs for policy initiatives or policy frameworks to support and develop their local Living Labs and quattro helix collaboration. The workshops took place in Lublin, Poland, in May 2019, in Oulu, Finland, in October 2019 and in Lund, Sweden, in January 2020.

In September 2019, each regional partner also conducted surveys and collected input from their local quattro helix stakeholders. Each partner consulted all four stakeholder groups: companies, public authorities, end-users and academia. The input was gathered during meetings, roundtable discussions and interviews and addressed the policies required to develop the Living Labs and the quattro helix collaborations.

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[1] Policy recommendations are:
https://web.uvic.ca/~sdoyle/E302/Notes/Policy%20Recommendation.html
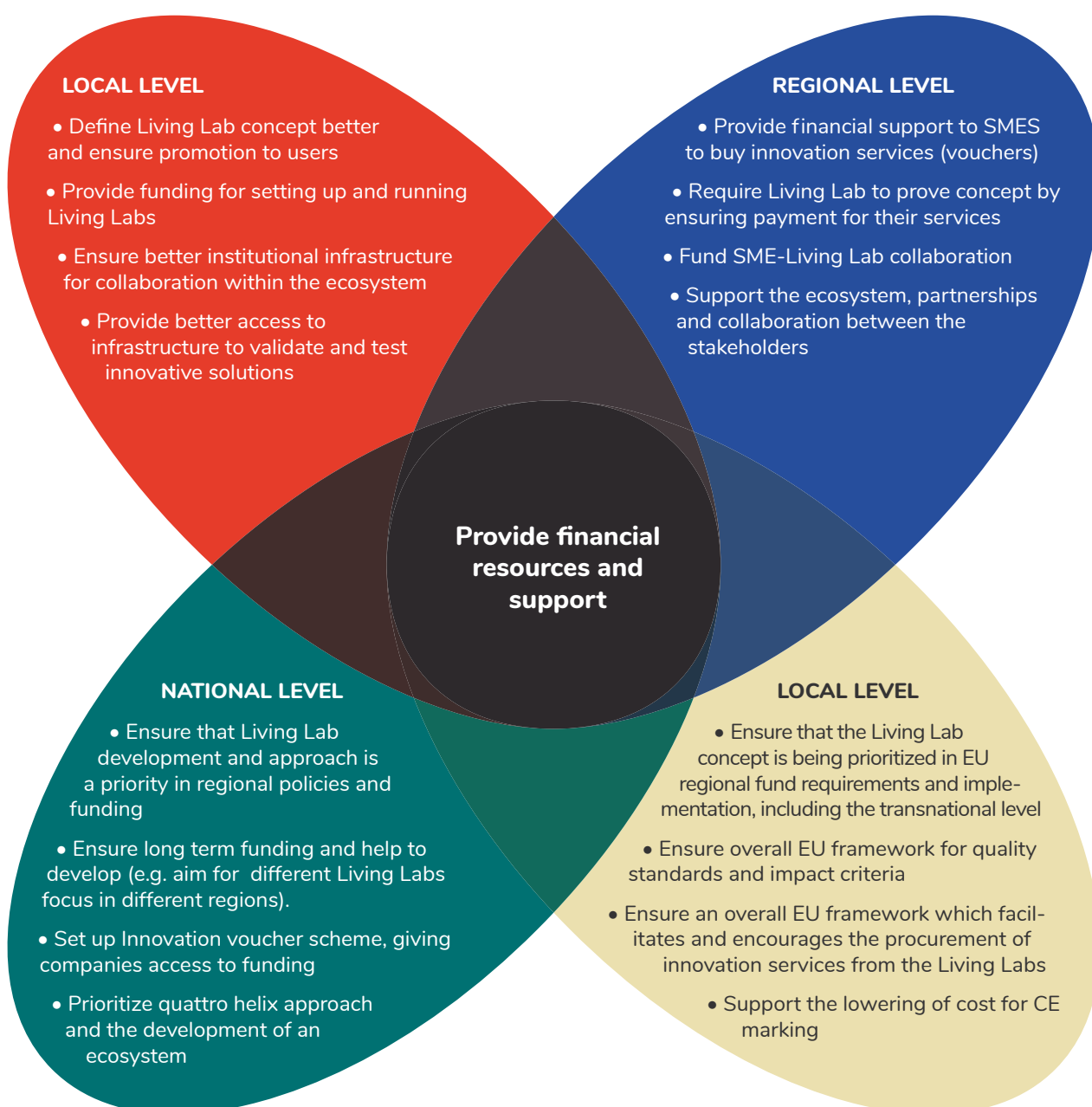
1. WORKSHOP IN LUBLIN MAY 2019

The ProVaHealth project partners participated in a first workshop on policy recommendations during the project meeting in Lublin in May 2019.

The workshop was introduced by small presentations of the policy recommendations needs arising from:
- The SME interviews (WP 4, Municipality of the Lublin City, Poland);
- Business Canvasses (WP 3.1, Laurea University of Applied Sciences, Finland);
- Self Assessment Toolbox (SAT-Tool) (WP 2, Tallinn University, Estonia).

The participants were divided into four groups with 4-6 participants in each group and were invited to share a first reflection on their perception of the policy actions needed at the local, regional, national and EU level on the basis of the presentation and their own experiences. They were given 90 minutes to work through their perception of the policies needed at all four levels of target audiences, after which each group presented their findings orally in plenum on the basis of the templates provided.

Main conclusions were:

LOCAL LEVEL
- Define Living Lab concept better and ensure promotion to users
- Provide funding for setting up and running Living Labs
- Ensure better institutional infrastructure for collaboration within the ecosystem
- Provide better access to infrastructure to validate and test innovative solutions

REGIONAL LEVEL
- Provide financial support to SMES to buy innovation services (vouchers)
- Require Living Lab to prove concept by ensuring payment for their services
- Fund SME-Living Lab collaboration
- Support the ecosystem, partnerships and collaboration between the stakeholders

Provide financial resources and support

NATIONAL LEVEL
- Ensure that Living Lab development and approach is a priority in regional policies and funding
- Ensure long term funding and help to develop (e.g. aim for different Living Labs focus in different regions).
- Set up Innovation voucher scheme, giving companies access to funding
- Prioritize quattro helix approach and the development of an ecosystem

LOCAL LEVEL
- Ensure that the Living Lab concept is being prioritized in EU regional fund requirements and implementation, including the transnational level
- Ensure overall EU framework for quality standards and impact criteria
- Ensure an overall EU framework which facilitates and encourages the procurement of innovation services from the Living Labs
- Support the lowering of cost for CE marking

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# 2. OUTCOME OF QUATTRO HELIX STAKEHOLDERS SURVEY AND ROUNDTABLES IN REGIONS

All partners of the ProVaHealth project were invited to consult their regional quattro helix stakeholders in August 2019 with a view to bring detailed and informed input on regional policy needs for Living Labs to the October workshop in Oulu, Finland. The partners were provided with a questionnaire and a methodology for the involvement of their stakeholders, addressing the key policy challenges for their local Living Labs. The partners were invited to collect answers from two to four representatives of each category of the quattro helix stakeholders in their region through round table meetings or interviews: public sector, companies, academia and end-users. The questions should be asked orally over the telephone or during face to face meetings with the stakeholder(s). The questionnaires were not intended to be circulated in the written form. The questions were to be answered with the local Living Labs/test center in mind and the answers should be achievable solutions to local challenges.

The following questions were asked:
- How to support the development of Living Labs and quattro helix cooperation?
- What kind of support do Living Labs mostly need?
- In which phase is the support most critical?
- How to combine support strategies to achieve the continuous and resilient development of Living Labs?
- How to involve policy makers in the process?

The chart below reflects the number of questionnaires filled out in a given country by the quattro helix stakeholders. In total, the partners interviewed 37 public sector stakeholders; 15 companies; 4 end-users and 7 academia representatives (63 in total). Some partners decided to make a summary after the meeting, while other partners provided one questionnaire per interviewee. See Annex 2 for further detail.

NUMBER OF RESPONDENTS PER COUNTRY AND PER CATEGORY OF QUATTRO HELIX STAKEHOLDER
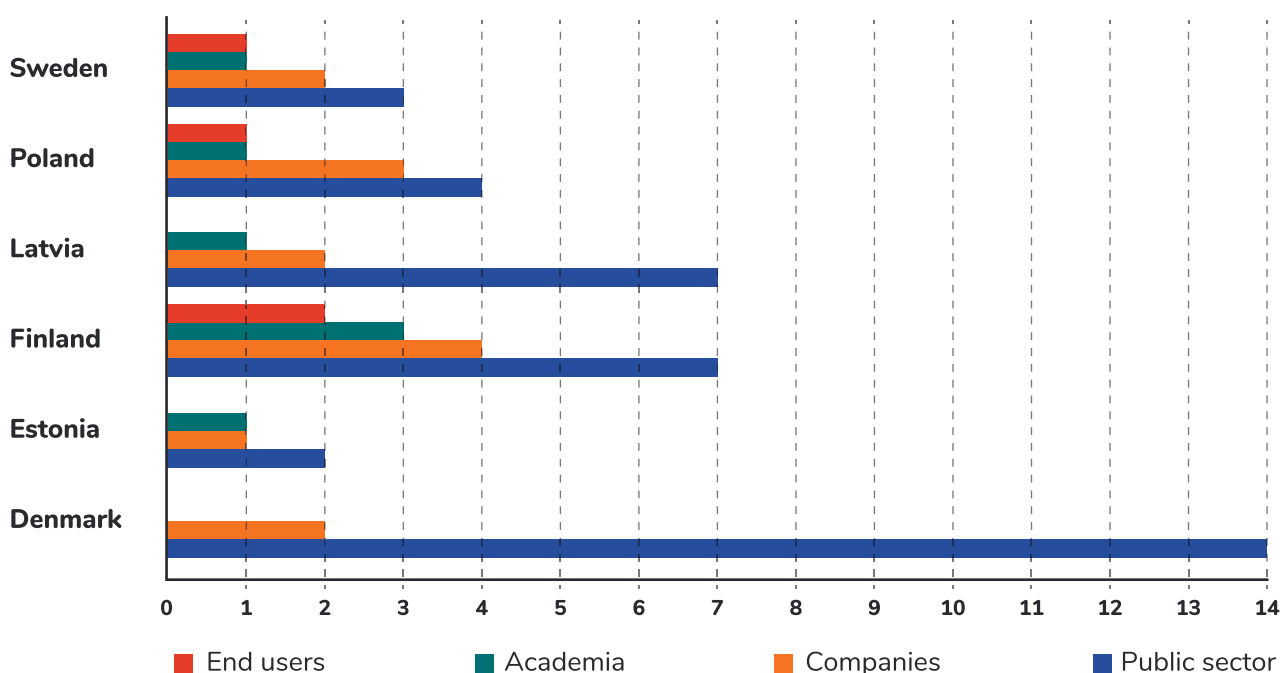
1. The need of public and private funding is mentioned by the stakeholders in almost every country, within every group (19% of total) Some respondents (3%) are paying more attention to paying customers - private funding, as a direct connection with the market. Most of them favor a sustainable financial support structure (6%).
2. In each group, the representatives highlighted that the visibility of the Living Labs should be increased and the marketing should be stronger" (17%).
3. A competent management team, who understand actual market needs, is crucial for Living Labs (15%). This will improve the Living Labs market position and also strengthen the quattro helix cooperation.
4. 9% of the stakeholders mentioned legal regulation barriers as an obstacle for Living Labs.

1. Representatives of all stakeholder groups see a need to create an organized network to facilitate communication and partner search.
2. There is a need of professional management of the Living Lab to control, develop and manage the Living Lab structures and budgets.
3. Provide grants (11%), give access to end-users (9%) and structure Living Lab initiatives in a more strategic way (9%) are crucial to ensure alignment with current market needs.
4. The Living Labs must define a clear value proposition for each quattro helix partner and support communication, cluster collaboration and networking.
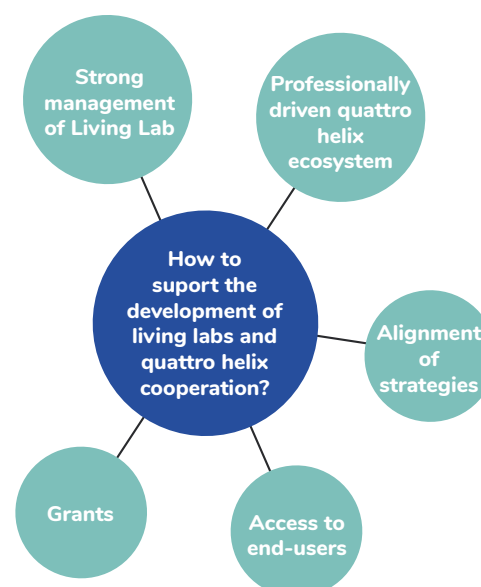
1. Most stakeholders think that product conceptualization (31%) and validation (31%) are the most important activities for the Living Lab.
2. For SMEs at the early stage, assistance in the conceptualization phase is crucial. For more developed SMEs, with experience in product or service testing, validation is a key phase.
3. The answers do not differ much between countries and groups of stakeholders. All highlight conceptualisation and validation as the most important.

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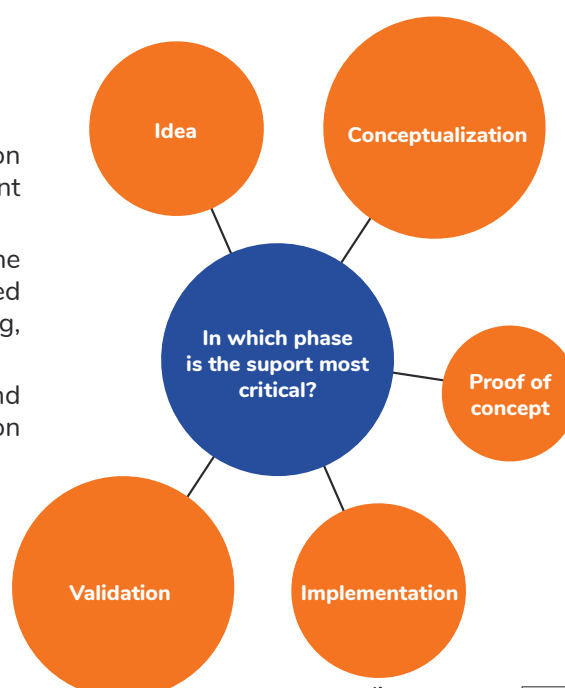
1. The stakeholders provided many ideas on how to support Living Labs and less ideas on how to combine strategies. It appears difficult to align strategies.
2. Some of the respondents reflected on the general idea of strategic development in support of Living Labs, others provided ideas for the regional level.
3. Some respondents provided advice on how to improve the Living Labs own strategy, like specifying clear value.

Sustainable network of national LL contact points

Clear role for LLs in all call for projects

Strategy for needs of all quattro helix actors

How to combine strategies to achieve the development of Living Labs?

Clear purpose and value of LL to address strategies

Financing instruments adjusting

Develop innovation ecosystem

Funding projects and service vouchers

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1. Policy makers must be aware of the Living Lab concept and know how to support it. Policy makers can be informed through personal contacts, involvement in projects and in strategic development processes.
2. Some stakeholders (7%) state that it is not necessary to involve the policymakers in the Living Lab processes, as they operate at a higher strategic level and make decisions on public framework funds for the Living Lab operations.
3. Common projects (7%) give a chance to involve policy makers and make them more active on the topic.

Invite policy makers to participate in test processes

Connect LLs services with innovation strategies

Personal contacts

How to involve policy makers in the process?

No involvement is needed

Roundtables with LLs representa-tives

Common projects and meetings
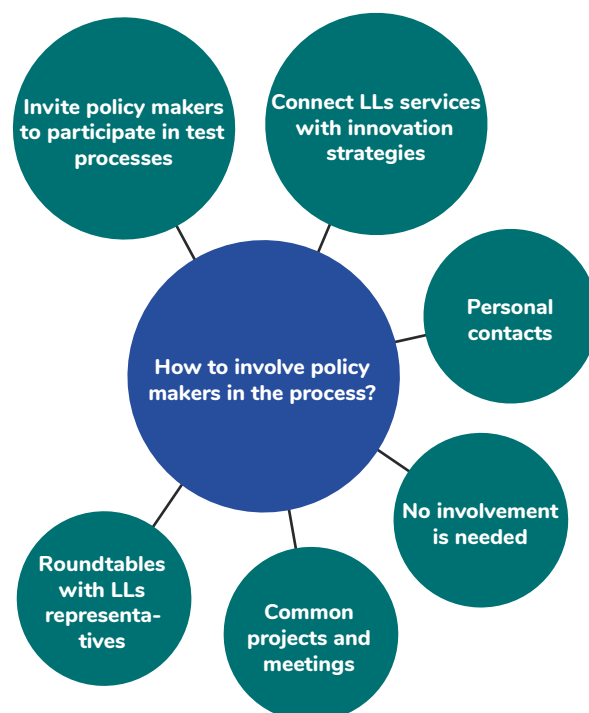
* the size of the circle corresponds to the importance given by the respondents

The policy recommendation workshop in Oulu on 17th of October 2019 was based on the outcome of the policy recommendation workshop in Lublin and the learnings from the consultations of the quattro helix partners in all the regions conducted during the month of September. During the Oulu workshop, external experts were invited to present their experiences of developing and implementing policy recommendations for Living Labs and quattro helix collaboration at the international level. The five external international experts all represented networks and projects with similar objectives as the ProVaHealth project. They all strive to develop methods and systems which identify the needs of the public health care systems and create a match with innovative companies. They all work cross-border. The experts represented the Oulu Health ecosystem; the Nordic Proof project; the Oulu Health Network and the Interreg Europe funded ITHACA project. Written input was also given by the Innosup project, as well as the Cross4Health, OSIRIS and other recent EU projects. All provided advice to the ProVaHealth project partners, to ensure that the ProVaHealth project work is based on state of the art knowledge and experience from other key players in the field.

SUMMARY OF EXPERTS ADVICE

The experts all agreed that a strong supporting policy framework is very important for the development of the ecosystem at local and regional level. Commitment from the political and administrative levels and sufficient allocation of resources are key. All major stakeholders of the quattro helix at the local and regional levels must be involved and committed to secure the successful implementation of a Living Labs structure. The policy framework must support the implementation effort at all levels, ensure that the work on Living Labs is prioritized and contribute to ensure solid external marketing and an inflow of funds. The entire value chain must buy-in to provide a smooth path for the SMEs through the different steps of the innovation, and validation cycle.

All the consulted experts from the Nordic Proof project, Oulu health networks, the Cross for Health project and the Innosup project, would like to collaborate with the ProVaHealth project partners in the future setting up of a transnational Living Labs service.

A first step could be to agree on a common contact form to ensure rapid circulation of requests and ideas between the existing networks and Living Labs in the Baltic Sea.

Solid and systematic marketing of the transnational collaborative network is key for its success. Such marketing is done best through presence at events and conferences, not only through emails or written campaigns. The goals of the network must be described in a simple manner to create maximum awareness impact at all levels. To ensure the ongoing attention of the medical staff, and avoid them feeling that they waste time, it is important to carefully match the company, who wants to participate in a test programme in the Living Labs, and the health system structure.

The Oulu representatives suggested to jointly set up a larger network of testbeds in the Nordic area, which each have a different theme for their activities. There is already a nordic test beds collaborative in Oulu which could be extended in collaboration with the ProVaHealth partnership.

The ProVaHealth partnership should pay attention to the development of the EU Digital Innovation Hub[2] when developing a transnational Living Labs service structure. The EU digital Innovation Hub is key to the future support from the EU level. As a novelty, the objectives of the Innovation Hub are oriented towards the development of services, not only focusing on devices or technology, as in the past. The ProVaHealth partnership must therefore also ensure that attention is paid to the development of new services, as a product in itself or to support the introduction of technology.

The new EU medical device directive which is currently being implemented in the EU Member States[3] contain new wording and rethinking of the definition of consumer oriented assistive technologies and medical devices. It introduces a requirement of post market studies of the effect of the product.

Also see annex 2 for list of links to the international experts who provided input to the ProVaHealth partnership during the Oulu meeting.

WORKSHOP SESSION

The presentations were followed by a workshop session, in which the Finnish policy experts and external invitees also participated.

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The workshop was inspired by the EU Blueprint methodology[4], developed by the European Innovation Partnership on Active and Health Aging[5], to envision realistic health and care needs of certain groups in the society. The workshop was designed around four different personaes, each representing one of the stakeholder groups of the quattro helix system: public sector, end-user, academia and companies.

QUATTRO HELIX STAKEHOLDER	PERSONAE
PUBLIC SECTOR	• Nurse/doctor. Is a gerontologist, Patients often fall, some are hip operated • X man. Politician. Member of Regional Council or National Parliament health committee • Municipality
END-USER	Emma - 85 years old, living at home. Walks badly, has problems getting out and about, no children close by, depends on help from the public system
ACADEMIA	Researcher who has developed a monitoring device and wants to test it with users
COMPANY	Company focussing on developing and selling innovative solutions for the health care system

Six working groups were asked to discuss and produce policy answers to three main challenges from the perspective of the personas:

CHALLENGE 1	CHALLENGE 2	CHALLENGE 3
The personas needs for **framework policy** to support their work on developing and implementing innovative health solutions: • local, • regional • national • EU	The personas **practical advice** on how to deal with the implementation of the demand side of innovation and public procurement • home, • care organisation • business (procurement)	The personas view on culture and communication What are the obstacles? How to address them?

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**PUBLIC SECTOR-NURSE/
DOCTOR:**

Knows and understand the end-users;
Should not be involved in bureaucracy and
procurement processes;
Should get the useful final devices quickly in
order to test on patients;
Focuses on quality of services, and the clever use of
resources;
Need communication amongst medical staff and
patients;
Local authorities must provide funding for
innovation processes.

**PUBLIC SECTOR-
POLITICIANS:**

Need to prove success of policies
at intervals of election periods;
Must understand the value of innovation;
Must ensure access to funding;
Must communicate the results and the
effort to national and EU level to ensure
understanding and endorsement of effort;
Local and regional policy tools for
innovation and ecosystem are key;
Should be provided with key
success messages to help them
communicate with each other.

**PUBLIC SECTOR-
MUNICIPALITY:**

Pre study to define the need. Is it
a process need, something already on
the shelf (normal procurement), or do we
have to look for new innovations to solve
the need?. (Innovative procurement, perhaps
tests in living labs.
Need to encourage joint development
projects between municipalities and
service providers.

END-USER

Needs to feel secure and
heard, be active in the process;
All the other stakeholders must listen
to and understand end-user needs;
Not only technological innovation matters,
but also social innovation;
Devices to be given for free, or easy access to
financing;
Needs assistance and after-sale services;
To be invited to living labs for testing;
Government to support service
programmes, and ensure attention
to individual needs and
functionalities.

SME/COMPANY

The ecosystem must provide
access to needs (bank of needs);
New solutions must be based on the needs;
SME can help find existing solutions, when a
need has been identified
Need for channels for submitting ideas to the
public sector: Oulu Innovation has an open platform
for ideas which works perfectly, templates do not
work; (ORCHIDEA tool) - Tallinn also has good
results with open platform;
Need easy access to testing and selling, at
local or transnational level, depending on the
product;
Companies lack understanding of
health care system, regulations and
policies.

**ACADEMIA/
RESEARCHER**

Local, regional and national level
policy makers must ensure the existence
of a networking platform between science
and business;
Need access to health data that can be used in
research and publications;
Should provide methodology and validation;
Must know how the innovation system
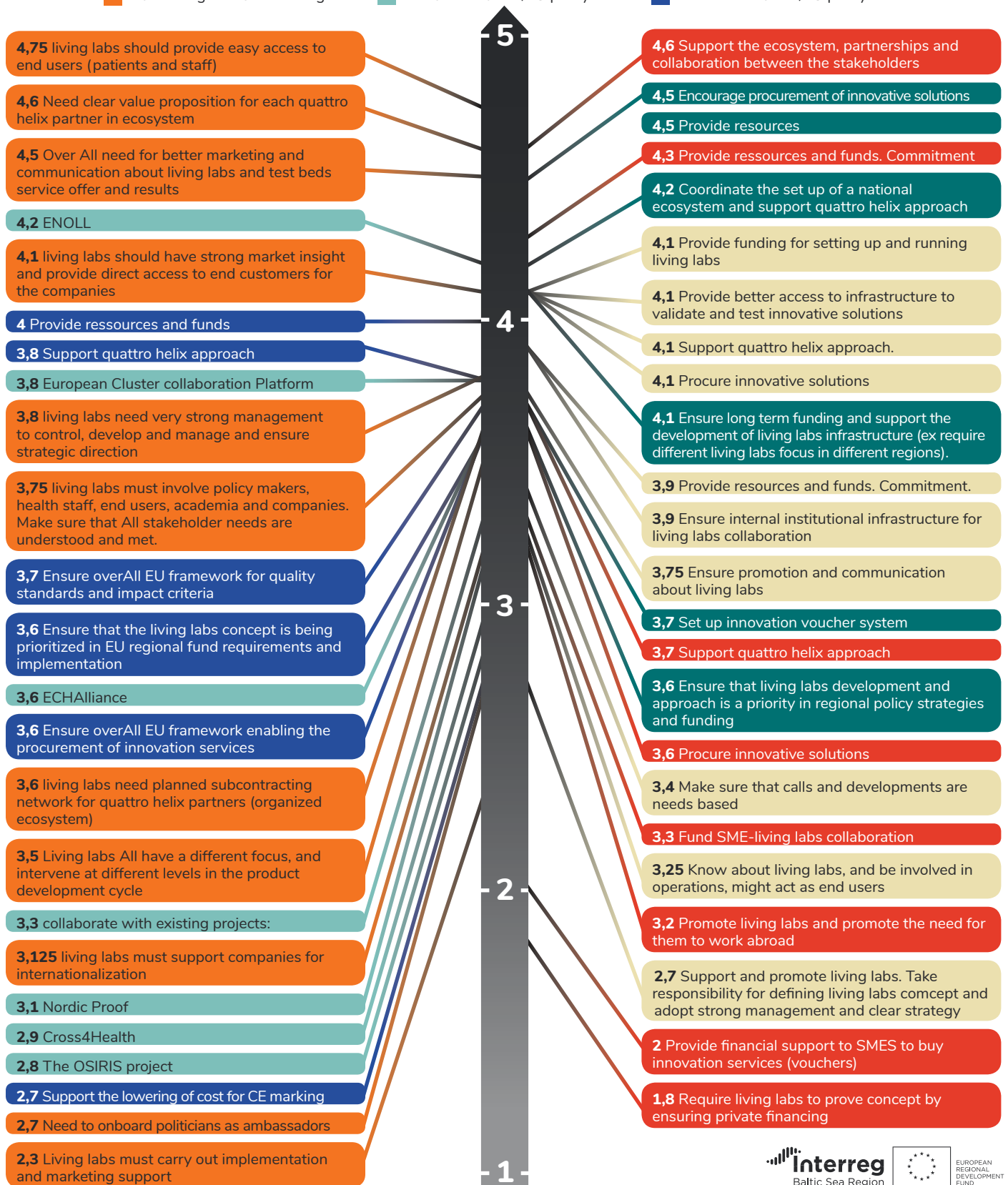works;
Can ensure the education and training
perspective;
Researchers need EU
funding.

During the workshop in Lund on 21-22 January 2020 the participants were given an overview of the results of the stakeholder survey on their perceived needs for policies to support Living Labs conducted in all the partner regions in September 2020, as well as a summary of all the draft policy recommendations stemming from the workshops in Lublin in May and Oulu in October 2019.

The 24 participants then worked together two by two to assess and rank the relevance of the policy recommendations on a scale from 1-5 with the following results:

Legend:
- The regional policy level
- Internal organisation of living labs
- The local policy level
- The transnational/EU policy level
- The national policy level
- The reansnational/EU policy level

Left column:

- **4,75** living labs should provide easy access to end users (patients and staff)
- **4,6** Need clear value proposition for each quattro helix partner in ecosystem
- **4,5** Over All need for better marketing and communication about living labs and test beds service offer and results
- **4,2** ENOLL
- **4,1** living labs should have strong market insight and provide direct access to end customers for the companies
- **4** Provide ressources and funds
- **3,8** Support quattro helix approach
- **3,8** European Cluster collaboration Platform
- **3,8** living labs need very strong management to control, develop and manage and ensure strategic direction
- **3,75** living labs must involve policy makers, health staff, end users, academia and companies. Make sure that All stakeholder needs are understood and met.
- **3,7** Ensure overAll EU framework for quality standards and impact criteria
- **3,6** Ensure that the living labs concept is being prioritized in EU regional fund requirements and implementation
- **3,6** ECHAlliance
- **3,6** Ensure overAll EU framework enabling the procurement of innovation services
- **3,6** living labs need planned subcontracting network for quattro helix partners (organized ecosystem)
- **3,5** Living labs All have a different focus, and intervene at different levels in the product development cycle
- **3,3** collaborate with existing projects:
- **3,125** living labs must support companies for internationalization
- **3,1** Nordic Proof
- **2,9** Cross4Health
- **2,8** The OSIRIS project
- **2,7** Support the lowering of cost for CE marking
- **2,7** Need to onboard politicians as ambassadors
- **2,3** Living labs must carry out implementation and marketing support

Right column:

- **4,6** Support the ecosystem, partnerships and collaboration between the stakeholders
- **4,5** Encourage procurement of innovative solutions
- **4,5** Provide resources
- **4,3** Provide ressources and funds. Commitment
- **4,2** Coordinate the set up of a national ecosystem and support quattro helix approach
- **4,1** Provide funding for setting up and running living labs
- **4,1** Provide better access to infrastructure to validate and test innovative solutions
- **4,1** Support quattro helix approach.
- **4,1** Procure innovative solutions
- **4,1** Ensure long term funding and support the development of living labs infrastructure (ex require different living labs focus in different regions).
- **3,9** Provide resources and funds. Commitment.
- **3,9** Ensure internal institutional infrastructure for living labs collaboration
- **3,75** Ensure promotion and communication about living labs
- **3,7** Set up innovation voucher system
- **3,7** Support quattro helix approach
- **3,6** Ensure that living labs development and approach is a priority in regional policy strategies and funding
- **3,6** Procure innovative solutions
- **3,4** Make sure that calls and developments are needs based
- **3,3** Fund SME-living labs collaboration
- **3,25** Know about living labs, and be involved in operations, might act as end users
- **3,2** Promote living labs and promote the need for them to work abroad
- **2,7** Support and promote living labs. Take responsibility for defining living labs comcept and adopt strong management and clear strategy
- **2** Provide financial support to SMES to buy innovation services (vouchers)
- **1,8** Require living labs to prove concept by ensuring private financing

Scale: 5 · 4 · 3 · 2 · 1

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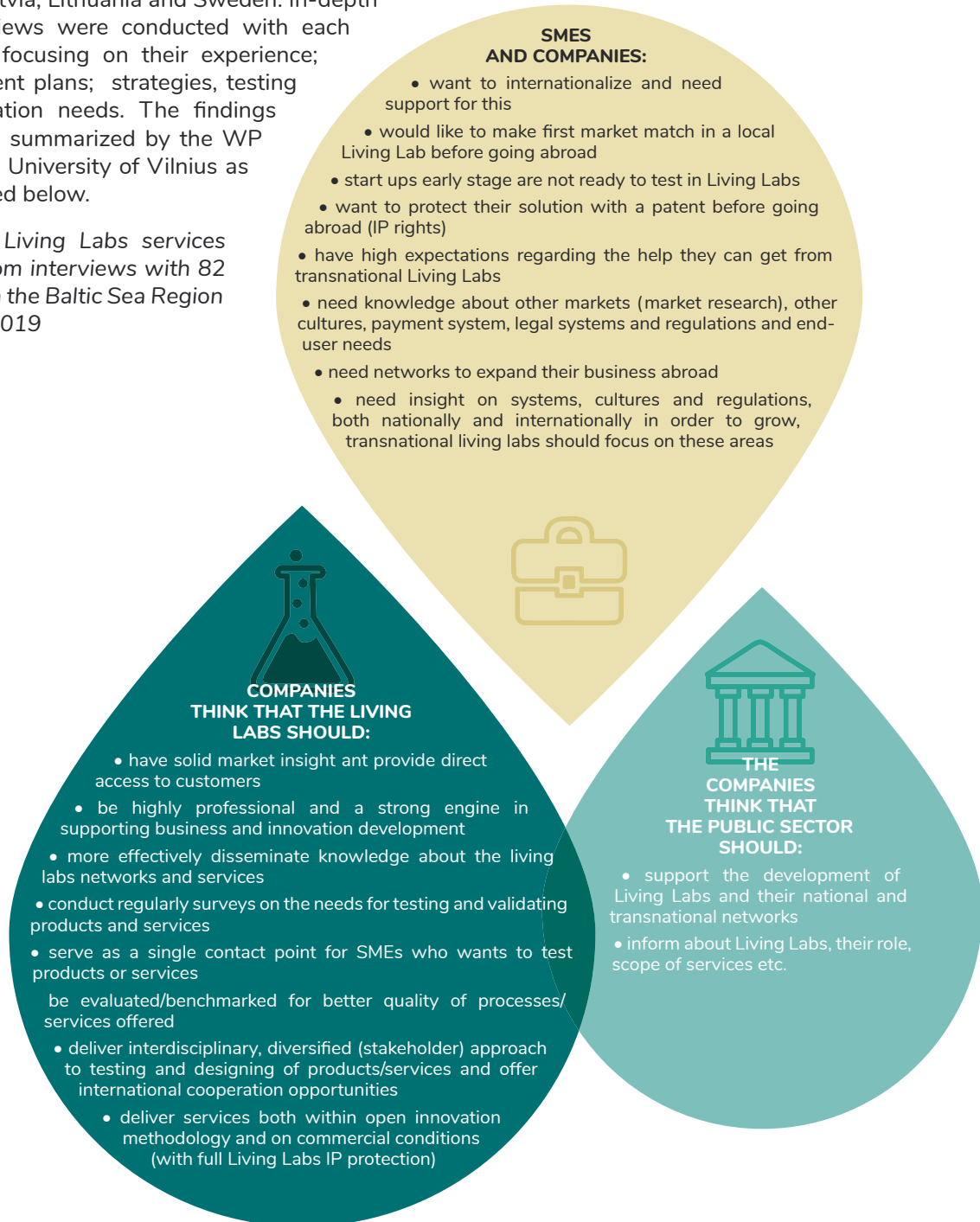EUROPEAN REGIONAL DEVELOPMENT FUND
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2. POLICY RECOMMENDATIONS NEEDS ARISING FROM SME INTERVIEWS

WP4 TASK 4.1 - SME INTERVIEWS

Within the task 4.1, 82 SMEs working within the field of health innovation were interviewed to assess their needs for Living Labs services within the BSR area. The 82 companies were a mix of start ups and established SMEs from Denmark, Estonia, Finland, Germany, Poland, Latvia, Lithuania and Sweden. In-depth 1:1 interviews were conducted with each company, focusing on their experience; development plans; strategies, testing and validation needs. The findings have been summarized by the WP leader, the University of Vilnius as summarised below.

Needs of Living Labs services derived from interviews with 82 SMEs from the Baltic Sea Region in spring 2019

SMES AND COMPANIES:

- want to internationalize and need support for this
- would like to make first market match in a local Living Lab before going abroad
- start ups early stage are not ready to test in Living Labs
- want to protect their solution with a patent before going abroad (IP rights)
- have high expectations regarding the help they can get from transnational Living Labs
- need knowledge about other markets (market research), other cultures, payment system, legal systems and regulations and end-user needs
- need networks to expand their business abroad
- need insight on systems, cultures and regulations, both nationally and internationally in order to grow, transnational living labs should focus on these areas

COMPANIES THINK THAT THE LIVING LABS SHOULD:

- have solid market insight ant provide direct access to customers
- be highly professional and a strong engine in supporting business and innovation development
- more effectively disseminate knowledge about the living labs networks and services
- conduct regularly surveys on the needs for testing and validating products and services
- serve as a single contact point for SMEs who wants to test products or services
- be evaluated/benchmarked for better quality of processes/services offered
- deliver interdisciplinary, diversified (stakeholder) approach to testing and designing of products/services and offer international cooperation opportunities
- deliver services both within open innovation methodology and on commercial conditions (with full Living Labs IP protection)

THE COMPANIES THINK THAT THE PUBLIC SECTOR SHOULD:

- support the development of Living Labs and their national and transnational networks
- inform about Living Labs, their role, scope of services etc.

Transnational Living Labs are important for increased innovation development and business growth across borders. A transnational Living Lab network should be created

Promotion campaigns should be organised (e.g by Scanbalt and ENOLL) for export agencies, trade associations, national entrepreneurship agencies about Living Labs and their services

GENERAL COMMENTS

- The concept of Living Labs and their services is unclear and in some cases even unknown
- The difference between test beds and Living Labs is not well understood

As described throughout this report, the partnership arranged three workshops aimed at identifying the partners' needs for policy initiatives or policy frameworks to support and develop their local Living Labs and quattro helix collaboration. The workshops took place in Lublin, Poland, in May 2019, in Oulu, Finland, in October 2019 and in Lund, Sweden, in January 2020.

In September 2019, each regional partner also conducted surveys and collected input from their local quattro helix stakeholders. Each partner consulted all four stakeholder groups: companies, public authorities, end-users and academia. The input was gathered during meetings, roundtable discussions and interviews and addressed the policies required to develop the Living Labs and the quattro helix collaborations.

The overall resulting policy recommendations are presented in the graphic below:

EU LEVEL POLICY FRAMEWORK MUST:
- Living Labs concept to be prioritised in EU policies and ensuing EU funding allocations
- Quattro helix thinking in EU policies and ensuring funding availability
- EU Digital Innovation Hub
- EU Medical Device Directive
- Overall EU framework for quality standards and impact criteria
- Overall EU framework enabling the procurement of innovation services

TRANSNATIONAL POLICY FRAMEWORK MUST:
- Support collaboration
- All existing networks and structures consulted expressed a desire for collaboration and coordination of transnational Living Labs services

LOCAL POLICY FRAMEWORK MUST:
- Give strong priority to the marketing of Living Labs services
- Provide Funding
- Ensure strong institutional framework for collaboration, i.e. managed ecosystem,
- Set up and maintain well structured internal systems and processes to match needs of user institutions with companies capable of developing solutions
- Ensure procurement of new solutions

NATIONAL POLICY FRAMEWORK MUST:
- Guarantee long term buy-in to Living Labs approach and quattro helix thinking in policies and funding strategies
- Procure innovative solutions

REGIONAL POLICY FRAMEWORK MUST:
- Develop, support and manage quattro helix stakeholder ecosystem
- Fund SME-Living Labs collaboration,
- Procure innovative solutions
- National level decide in the Baltic States

1. *Strong, long term policy support needed at all levels of government*

The Living Labs and quattro helix approach to growth and development must have policy support from all levels of government to thrive: EU, national, regional and local. The support must be long term and cover several electoral periods to have effect. The EU growth and development policy priorities are particularly important factors, as they provide the strategic framework for the national, regional and local thinking regarding the importance and impact of quattro helix collaborative networks and the development of some kind of Living Labs structure at the local level. Strong assignment documents and strategies must be drafted, involving partners at all levels. Underdeveloped policy support equals bad implementation. A strong and sustained policy framework and implementation at all levels will ensure the necessary entire value chain buy-in over time.

2. *To cultivate atmosphere of dialogue and cross sector collaboration within quattro helix*

There is a disconnect between industry, care consumers and care providers. Health care providers and regional innovation ecosystems tend to operate in a fragmented way. There is a lag between what end-users need, what SMEs are creating and need to test/validate and what healthcare providers/funders seem prepared to do. The value chain is complicated and incoherent. This can be addressed through increased dialogue and cross sector collaboration.

To illustrate the need for this approach, the ProVaHealth partners worked in a design thinking process from the perspectives of the different quattro helix stakeholders, and collected the following insights into the stakeholders needs:

- *Public sector/health organisations, nurse/doctor* need access to finalized devices. They can provide access to end- users and ensure quality.
- *Public sector/care organisation* need to identify innovation needs and participate in joint development processes. Need to look for existing solutions before embarking on innovations.
- *Public sector/politician* need to have access to success stories and results to ensure continued support and funding for Living Labs. Need to ensure procurement of innovation.
- *The SME/company* need access to bank of innovation needs from the public health system and also need to have a good overview of existing products and solutions. They need to show their solutions to public sector. Need easy access to end-users/testers. Need help to understand the workings of the public health system. Wants to internationalise once the product is proven in the home market. Need help from the Living Labs, who must know the market and clients at home and abroad.
- *End-users* need access to best possible devices. Need to feel safe. Need to be involved and listened to. Needs help.
- *Academia/researcher* need networking platform between science and business. Would like to provide methodology and validation. Can ensure teaching and training.

3. *Policy design must involve all quattro helix users*

The policy design and strategies aimed at fostering innovation in the health system and the growth of innovative SMEs within the health sector must support dialogue and quattro helix thinking. To achieve this, the following elements must be included in the policies:

- Creation, involvement and set up of end-user forums / platforms
- System to collect innovative ideas from the health care system
- Organisation of meeting platforms for companies and public health system to test ideas
- Creation of openness for dialogue, communication and exchanges to make the various silos and worldviews gain a better mutual understanding

There is a need for more dialogue to create mutual understanding of the needs of all the stakeholders. All policy initiatives must therefore create incentives for collaboration and dialogue between the quattro helix partners, as described above. More and better cross sector dialogue is a key working method for development, and implementation of innovative solutions. A stronger culture for contact and dialogue between end-users, business and health systems must be nurtured. This can be done in many different ways, but a starting point is to create a quattro helix ecosystem, nominate all relevant stakeholders as members and make sure to carry out strong branding and communication activities at all related events.

4. *The Living Labs must be very professionally driven*

The ProVaHealth project revealed the need for a strong internal organisation and structure for the living lab to be successful. The living lab must be very professionally driven and staff must have a wide set of skills and competences. They must be able to ensure access to end-users. They must know about the needs for innovation in the public sector. They must deliver an interdisciplinary, diversified service and have a high level of knowledge of markets and potential clients. They must be able to act as single contact point, so no-one is referred. The communication and marketing of the living lab services must be carried out in a very professional manner with clear, short descriptions of services and results. The marketing must be consistent over long time, and the key messages must be put forward collectively by all stakeholders in the living lab ecosystem.

5. *Strong communication needed - simple messages*

As most Living Labs are publicly driven, with public funding support, it is crucial for the daily running and continued support of their activities, that they undertake continued communication and dialogue with their stakeholder environments about their activities and results. This is also crucial for the Living Labs who operate pay-by-service and who need to attract and retain clients. The Living Labs must give high priority to communication with their potential clients and users, and with all levels of government in order to ensure continued support, inflow of clients and smooth collaboration with the health systems. Very strong marketing is needed. Systematic and continued presence at events and systematic and continued marketing. Concrete and precise goals. Simple, precise communication about objectives, activities and results.

6. *Transnational living lab collaboration with existing networks and organisations*

A future transnational living lab structure should be built in collaboration with existing national and international health innovation networks and Living Labs structures to jointly develop and mature the market. It appears that the transnational networks currently have little knowledge of each other. But all the existing international networks and projects consulted during the lifetime of the ProVaHalth project, who work transnationally to help innovations access markets abroad, are eager to collaborate with the ProVaHealth partnership in a future network.

Together, the partnership behind a coordinated transnational living lab network can monitor and influence developments at EU level. Policies in support of digital growth and development for the next budgeting period of 2021- 27 are currently being developed. Such a network would have more impact on the policy formulation at EU level, than each of the projects individually, and thereby also better enable future support for the living lab and quattro helix approach to trickle down through the policy levels to the national, regional and local level.

7. *All levels of government must support Living Labs financially*

All levels of government: local, regional, national, and the EU must provide financial resources and support for the set up and running of the living lab structures in order for them to succeed. The value of a cross sectoral, needs- and dialogue- based collaboration in quattro helix ecosystems and Living Labs must be enshrined in policy and strategies at all four levels of government, to ensure that the funds in support of the implementation in real life are allocated. The Living Labs and their ecosystems are strategic lighthouses working in a difficult field of economic development. They need political and financial support to sustain their activities.

There are various smaller financial schemes in place around the Baltic Sea area to encourage collaboration with Living Labs and quattro helix collaboration in order to bring innovations to the market. Access to small scale innovation vouchers have proven an efficient incentive in Sweden, to secure the involvement of companies and health organisations in mutual development schemes.

To sum up:
- Local level – define concept – ensure promotion, set up strong institutional framework, provide access to end-users
- Regional level – define Living Labs concept, support quattro helix ecosystem
- National level – prioritise quattro helix and Living Labs concept in growth and development policies and overarching strategies
- EU level – prioritise quattro helix and living lab development in EU policies and frameworks
- All to provide strategic support and financial resources

Below is a summary of the replies from the quattro helix partners consulted in the different countries and the policy advice they provided.

PARTNER/COUNTRY	MAIN POLICY ADVICE
ESTONIA Tehnopol Tallinn University Haapsalu Neurological Rehabilitation Centre	**To support Living Labs:** • Ensure strong management capacities • Clear legal framework for Living Labs activities • Provide public and private funding • Provide project funding and service vouchers **To involve policy makers and combine strategies:** • Implement innovation procurement • Policy makers to be consulted by administrative personnel and through trade associations
FINLAND South-Eastern Finland University of Applied Sciences (XAMK) Oulu University of Applied Sciences / acronym: Oulu UAS Seinäjoki University of Applied Sciences Laurea University of Applied Sciences	**To support Living Labs:** • Create a planned network for all actors • Create clusters to involve all stakeholders and mix strongly research, education and society influence • Research on needs of each stakeholder to benefit from Living Labs • Public and private funding • Paying customers - private funding • Strong business model • More service development • Increased visibility and stronger marketing • Raise awareness of Living Labs • Competent management team directed towards actual market needs • Qualified staff of experts • Better collaboration between end users and companies • Provide opportunities for collaboration • Support startups **To involve policy makers and combine strategies:** • Clearly define purpose and value of Living Labs to ensure strategic integration • Organize joint meetings with experts in policy making and strategy implementation • Ensure long term Living Labs support and development • Use local EDF program + RIS3 + regional strategy for the use of local structural funds • Establish steering board with specialists from different domains • Implement projects aiming at producing strategies • Involve policy makers in testing from early stages through whole process • Implement common projects and update meetings • Create competition board with policy makers to approve finance grants for testing in Living Labs. • Provide project funding and services vouchers • Share best practices and information about effectiveness • Involve at the stage of strategy and implementation plan development

PARTNER/COUNTRY	MAIN POLICY ADVICE
SWEDEN Innovation Skåne	**To support Living Labs:** • Provide grants • Provide access to end users (patients, staff) • Structure various initiatives in a more strategic way • Create planned subcontracting network for all stakeholders • Develop sustainable financial support structures • Ensure a competent management team understanding actual market needs • Increased visibility and stronger marketing for Living Labs **To involve policy makers and combine strategies:** • Coordinate with Living Labs representatives for projects to achieve clear role for policy makers • Create sustainable network of national Living Labs contact points within countries/BSR • Use the Living Labs services within healthcare system innovation strategies
POLAND City of Lublin GAPR Ltd	**To support Living Labs:** Provide grants • Provide access to end users (patients, staff) • Structure various initiatives in more strategic way • Create planned subcontracting network for all stakeholders • Develop sustainable financial support structures • Competent management team towards knowledgeable about market needs • Increased visibility and stronger marketing for Living Labs· **To involve policy makers and combine strategies:** • Inform and involve policy makers during project implementation • Share best practices and information about effectiveness • Make personal contacts and ensure about the gain policy makers may get • Add Living Labs requirement to the financing instruments • Strengthen the links between researchers and entrepreneurs within innovation ecosystem • Develop clusters to promote Living Labs • Specify clear purpose and value of Living Labs to address strategies • Living Labs should support innovation development according to regional strategy of smart specialisations • Organizing joint meetings with experts in making policy and strategies implementation • Involving them in testing from early stages through whole process • Organizing meetings, roundtables with Living Labs representativesImplement projects aiming at producing strategies

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PARTNER/COUNTRY	MAIN POLICY ADVICE
LATVIA Latvian Health Tourism Cluster	**To support Living Labs:** • Research on needs and suggestions on how each stakeholder can benefit from the Living Labs • Inform about Living Labs concept broadly to all the stakeholders • Create planned subcontracting network for all stakeholders • Establish committees to organize and supervise processes • Provide opportunities for collaboration • Facilitate the testing processes • Create a Living Labs that has access to each of quattro helix representatives in one place • Provide strong management capacities • Create clusters to involve all actors and strongly mix research, education and society influence • Create motivation system for users to participate in the testing • Providing funds from developed products and collaboration • Raising awareness of Living Labs • Best practise adoption • Better communication between all stakeholders • Ensure compatibility between needs and provided services • Cooperating institutions must provide end-users • Ensure clear legal regulations on Living Labs activities • Increased visibility and stronger marketing • Public and private funding **To involve policy makers and combine strategies:** • Make personal contacts and inform about the gains of involvement • Organize meetings, roundtables with Living Labs representatives • Implement common projects and hold update meetings • Create horizontal dimensions of politics with clear responsibility for the processes • Follow new EU calls to include policy makers at national level • Creating competition board with policy makers to approve finance grants for testing in Living Labs. • Cooperate with political leaders • Connect with those who implement policies in practice
DENMARK The North Denmark Region - Aalborg University Hospital Health Innovation Zealand CoLab Denmark, Region of Southern Denmark	**To support Living Labs:** • Competent management team towards actual market needs • Provide grants • Public and private funding • Increased visibility and stronger marketing • Provide funds from developed products and collaboration • Provide access to end users (patients, staff) • Ensure human resources for daily activities • Qualified staff of experts • Structure various initiatives in a more strategic way • To find joint interest, clear value proposition for each of quattro helix actors • Provide opportunities for collaboration • More service development • Clear legal regulations towards Living Labs activities • Well defined term of Living Labs

PARTNER/COUNTRY	MAIN POLICY ADVICE
DENMARK The North Denmark Region - Aalborg University Hospital Health Innovation Zealand CoLab Denmark, Region of Southern Denmark	**To involve policy makers and combine strategies:** • Specify clear purpose and value of Living Labs to address strategies • Strengthen the links between researchers and entrepreneurs within innovation ecosystem • Devise strategy that links EU, public sector, businesses, scientists and start-ups needs • Provide Living Labs's central management with broad understanding of its idea and management skills • Structured approach to the coordination of Living Labs • Establishing broad strategic policy to achieve each level goals • Option of top-down requesting for urgent needs· • Involving them (policy makers) in testing from early stages through whole process • Make personal contacts and ensure about the gain they (policy makers) may get • Implementation of common projects and update meetings • Inform and involve them during the projects implementation • (Involve policy makers) At the stage of strategies and implementation plan development • Enable them (policy makers) to share positive experiences and success stories • Involve in the regional and healthcare development

ANNEX 2. WORKSHOP IN OULU, FINLAND, OCTOBER 2019. LIST OF INTERNATIONAL CONTRIBUTORS

Presentations and inspiration by Oulu Stakeholders, Nordic Proof, Ithaca, Innolabs, Cross4health and Osiris.

Center for Health and Technology. University of Oulu. Director Maritta Perala-Heape.
https://www.oulu.fi/cht/
https://www.oulu.fi/cht/node/55195

Business Oulu. Oulu Health Network, Director Minna Komu.
https://www.businessoulu.com/en/frontpage-old/en/search.html?q=health+network

Nordic Proof project Bent Håkon Lauritzen from Health Tech Norway
https://www.nordicproof.org/

ITHACA project. Erik Brander, Region of Zealand Denmark.
 https://www.interregeurope.eu/ithaca/

INNOLABS project white book. Call for ACTION

https://hcn.eu/innolabs-final-event-oslo-white-book/

Cross4Health
https://www.cross4health.eu/

OSIRIS
https://www.osiris-smartsilvereconomy.eu/

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EU DIGITAL INNOVATION HUB, AND EUROPEAN LEVEL NETWORKS

As part of the implementation of the **Digitising Europe Industrial Strategy**, the **Digital Innovation Hubs** catalogue was created, containing comprehensive information on the digital innovation hubs in Europe to help networking between DIHs across Europe.

The information provided is based on self-declarations and has been recent verified (based on the provided information) for compliance with the following criteria:

1. Be part of a regional, national or European policy initiative to digitise industry;
2. Be a non-profit organisation;
3. Have a physical presence in the region and present an updated website explaining the DIHs' activities and services provided for the digital transformation of SMEs/Midcaps;
4. Have at least 3 verifiable examples of how the DIH has helped a company with its digital transformation.

https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs

https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool

ENOLL (European Network of Living Labs)

https://ENOLL.org/

Living Labs (Living Labs) are defined as user-centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings.

ENOLL runs an expert group on Health Living Labs.

Living Labs Most Recent Publications. Living Labs Methodologies. Living Labs Research Papers

https://ENOLL.org/newsroom/

European Cluster collaboration Platform:

https://www.clustercollaboration.eu/vibrant-platform-service-cluster-organisations

The European Cluster collaboration Platform (ECCP) is an action of the Cluster Internationalisation Programme for SMEs funded under COSME launched by DG GROW of the European Commission in 2016. The ECCP provides networking and information support for clusters and their members aiming to improve their performance and increase their competitiveness through trans-national and international cooperation.

ECHAlliance - Eco Systems in Europe

https://echAlliance.com/

The European Connected Health Alliance (ECHAlliance) is the Global Connector, facilitating multi-stakeholder connections around ecosystems, driving sustainable change and disruption in the delivery of health and social care.

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CLASSIFYING AND RANKING THE POLICY RECOMMENDATIONS GATHERED THROUGHOUT THE PROJECT

This table summarizes the results of the ProVaHealth workshop on Policy Recommendations on 21. January 2020 in Lund, Sweden. Participants were given a document with all the proposals and wishes for policies stemming from the workshops in Lublin, Poland in May 2019; the questionnaires from partner stakeholder roundtables in September 2019; and the policy recommendations workshop in Oulu, Finland in October 2019.

All participants were asked to rank the recommendations on a scale from 1-5. (five is highest) to devise the most important.

THANK YOU FOR YOUR CONTRIBUTION

Beata
bkrawczyk@gapr.pl