



IDIH

INTERNATIONAL COLLABORATION
DIGITAL TRANSFORMATION
HEALTHY AGEING

D3.5

3rd Expert Group Workshop Report

APRE

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Abstract

This report is part of the International Digital Health Cooperation for Preventive, Integrated, Independent and Inclusive Living (IDIH) project funded under the European Union's (EU) Horizon 2020 Research and Innovation Programme.

The current report summarises the 3rd Workshop of the *Preventive Care, Integrated Care, Independent and Connected Living*, and *Inclusive Living* Expert Groups. This Workshop gathered all Experts from the four previously-identified groups to develop the results obtained from the previous two Workshops and, further refined a shared vision of how to enhance international cooperation in the field of Digital Health for Active and Healthy Ageing (AHA).

The Workshop was structured in two parts: one online event that took place on November 19, 2021 and one follow-up activity carried out between November 2021 and January 2022. During the event, the participants were involved in three co-creation sessions to define common priorities in the AHA domain at the regional and international levels.

The follow-up activity further engaged the Experts in the validation of the common priorities identified in the co-creation exercise. The activity additionally, identified potential political, economic, social, technical, environmental, and regulatory barriers or opportunities that may affect the implementation of the designated priorities as well as mapped the target group and expected impacts of such priorities on international collaboration.

The final results of the Workshop will be thoroughly elaborated and presented in the *Roadmap: Towards the Enhancement of International Cooperation for Digital Health for AHA* (D3.7), foreseen by April 2022 as a key and final outcome of the project.

Keywords

Digital Health, Active and Healthy Ageing, Preventive Care, Integrated Care, Independent and Connected Living, Inclusive Living, Data Governance, Digital Inclusion, Interoperability.

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Abbreviations and Acronyms

Abbreviation, Acronym	Description
AHA	Active and Healthy Ageing
APRE	Agenzia per la Promozione della Ricerca Europea (project partner)
ATC	Athens Technology Center S.A. (project partner)
Catalyst	Catalyst @ Health 2.0 (project partner)
CEPS	Centre for European Policy Studies
CIHR	Canadian Institutes of Health Research (project partner)
EG	Expert Group
EU	European Union
G.A.C.	G.A.C Group (project partner)
GSBC	Global SMEs Business Council (project partner)
IC	Integrated Care (Expert Group)
ICL	Independent and Connected Living (Expert Group)
IDIH	International Digital Health Cooperation for Preventive, Integrated, Independent and Inclusive Living (full project title)
IL	Inclusive Living (Expert Group)
IoT	Internet of Things
NIA	National Institute on Aging (USA)
NIH	National Institutes of Health (USA)
PC	Preventive Care (Expert Group)
PESTEL	Political, Economic, Social, Technological, Environmental and Legal
PLC	Programme Level Cooperation
S2i	Steinbeis 2i GmbH (project coordinator)
SAWARABI	Sawarabi Group (project partner)
SPS	School of Pharmaceutical Science Tsinghua University (project partner)
UCG	Users Consultation Group
WP	Work Package (of a project)

Executive Summary

Following an Expert-driven approach, key experts, executives, and advocacy groups from the six regions (Europe, China, Canada, Japan, South Korea, and USA) were gathered by **International Digital Health Cooperation for Preventive, Integrated, Independent and Inclusive Living (IDIH)** to define common priorities in Digital Health and identifying opportunities of mutual benefit. The **Digital Health for Active and Healthy Ageing (AHA) Transformation Forum** was created by IDIH to serve as an umbrella and long-lasting Expert-driven mechanism to foster collaboration.

At the start of the project, IDIH partners set up Expert consultation groups under four distinct domains: *Preventive Care, Integrated Care, Independent and Connected Living, and Inclusive Living*. These areas represent core themes that set the scope for the Experts' work to develop a Roadmap for international collaboration for digital solutions in health care that benefit society as well as address policy makers and the relevant funding agencies in the EU and the five strategic partners countries involved in the project.

During the **1st EG Workshop in May 2020**, Experts worked on a common vision, investigated challenges and options for international collaboration, and defined a list of initial recommended topics for collaboration, which were subsequently validated by user groups and healthcare stakeholders, notably funding agencies, and health authorities.

During the **2nd EG Workshop in May 2021** and **follow-up co-creation Workshop during IDIH Week's Innovation Day in June 2021**, Experts further refined the priorities suitable for international cooperation in the field of Digital Health for AHA and proposed actions for the IDIH Roadmap; funding agencies helped to further identify policy gaps and future perspectives in the four thematic domains.

As one of the final iterations in creating the IDIH Roadmap, the **3rd EG Workshop in November 2021** aimed to identify the communalities and barriers of the three identified priorities for future collaboration and define a clear Vision statement with concrete actions within the next five to ten years to enhance the international dialogue.

As opposed to the previous Expert Group Workshops, the 3rd EG Workshop was conducted as a collective of all the Experts from the *Preventive Care, Integrated Care, Independent & Connected Living* and *Inclusive Living* Groups in order to broaden the scope of the discussion and trace the results gathered from the individual Experts Groups (EGs), with the ultimate goal of building a **shared vision of how to enhance international cooperation in the field of Digital Health for Active and Healthy Ageing (AHA)**.

1 Introduction and Background

This report is part of the International Digital Health Cooperation for Preventive, Integrated, Independent and Inclusive Living (IDIH) project funded under the European Union's (EU) Horizon 2020 Research and Innovation Programme.

The current report summarises the **3rd Workshop of the Preventive Care, Integrated Care, Independent and Connected Living, and Inclusive Living Expert Groups (EGs)**, which gathered all the Experts from the four groups to consolidate the results from the secular Expert Group level and in the previous two Workshops, to create a shared vision of how to enhance international cooperation in the field of Digital Health for Active and Healthy Ageing (AHA).

The Workshop was held in two sessions:

- An initial co-creation session that took place on 19 November 2021;
- A follow-up activity carried out between November 2021 and January 2022.

During the event, the participants were involved in a **co-creation session** to define common priorities in the AHA domain at regional and international level, starting from discussing the background findings of the project and reflecting on trends and the policy drivers in the domain of Digital Health & Ageing.

The **follow-up actions**, aimed to further engage the Experts in the validation of the common priorities identified during the co-creation session. Other objectives of these activities were to identify potential political, economic, social, technical, environmental, and regulatory barriers or opportunities that may affect the implementation of the common priorities as well as to map the target groups and expected impacts of such priorities on an international collaboration scenario.

In preparation for the co-creation session, Experts were provided with a comprehensive compendium of the state-of-the art, to ensure their alignment and knowledge of the IDIH project's history and achievements, along with the most recent international debate around Digital Health & Ageing. The following section provides an overview of the main assets brought to the attention of the Experts, which include:

- the IDIH 2nd EG Workshop and the 1st Programme Level Cooperation (PLC) meeting (May 2021),
- the IDIH Stakeholders Event (October 2021),
- the IDIH Thematic Webinar on Inclusive Design of Digital Solutions for AHA (November 2021).

1.1 The 2nd Expert Group Workshop and the 1st Programme Level Cooperation Meeting

During the 2nd EG Workshop in the third week of May 2021, the four Expert Groups engaged in distinctive meetings to further define, expand upon, and then disseminate a set of priorities related to each Expert Group’s respective domain to better outcomes in AHA.

In particular, during the Workshop, Experts collaborated on a priority setting exercise, gradually enriched and consolidated, combining a bottom-up and a top-down approach. For this exercise, the input and feedback from both users and policy makers during the previous Programme Level Cooperation ([PLC](#)) meeting and the Innovation Day of the [IDIH Week 2021](#) were used.

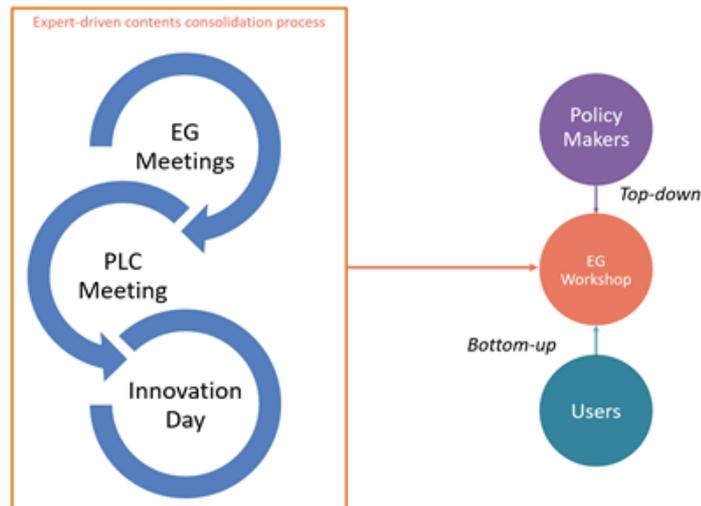


Figure 1: An Expert-Driven Contents Consolidation Process

Several common themes and keywords surfaced from IDIH partners’ analysis of the priorities identified by the Experts. The most frequent keywords among the priorities were: *data analysis/sharing/integration; common standards & guidelines; interoperability; stakeholder engagement; understanding of barriers; and care delivery.*

For a complete overview of the **keywords** assigned to the eighteen priorities created during the 2nd EG Workshop, please consult the *Report on the First Programme Level Cooperation Meeting* (part 2.5.1 *Presentation by the Rapporteurs of the IDIH Experts Groups*).

1.1.1 Priorities Suitable for International Cooperation in Each Expert Group Domain

The final outcome of the 2nd EG Workshop was a set of thematic priorities – one for each EG – considered as suitable for international cooperation in the field of Digital Health for Active & Healthy Ageing, for a total of eighteen **Priorities**, reported in D3.4 *Report of the 2nd EG Workshop* and seen in Table 1 below.

Table 1: Results of the 2nd Expert Group Workshop

PREVENTIVE CARE
<ul style="list-style-type: none"> ■ PRIORITY 1: Forward/backward longitudinal study and Big Data analysis to better understand the determinants of healthy ageing and the trajectory towards the "un-healthy": from normality to the presence of disease. ■ PRIORITY 2: Development of international standards and procedures for interoperable outputs of wearable (and all) technologies. ■ PRIORITY 3: Data analysis modelisation at different levels, such as: factors of wellbeing, diseases, and other determinants of health. ■ PRIORITY 4: Empowering individuals through co-design processes, digital literacy, and the use of evidence-based source of information. ■ PRIORITY 5: Creation of eco-systems, such as between academia/industry/consumers/institutions, for open innovation in wearables. ■ PRIORITY 6: Support the learning of health and wellness as well as social systems through access to data, procurements, and other sources of information.
INTEGRATED CARE
<ul style="list-style-type: none"> ■ PRIORITY 1: Digital inclusion and integrated care delivery through the deployment of novel digital solutions. ■ PRIORITY 2: Interoperability by design, through the incorporation of Big Data and the standardization of data-related infrastructure. ■ PRIORITY 3: Policy harmonisation and framework conditions policies to address transparency, security, ethics, privacy, and data preservation. ■ PRIORITY 4: Patient-centric long-term chronic care supported by standardised digital solutions and personalised medicine. ■ PRIORITY 5: Co-design and co-development – Health care service co-design and co-development with the involvement of caregivers across different typologies and disciplines (i.e., physiotherapists and doctors) to tackle gaps and barriers.
INDEPENDENT AND CONNECTED LIVING
<ul style="list-style-type: none"> ■ PRIORITY 1: Promoting independence and mobility through smart and connected communities and environments. ■ PRIORITY 2: Create a standardized framework for International Data Governance & Security based on interoperability and the sharing of patient-related data. ■ PRIORITY 3: Develop age friendly technologies to facilitate social connectivity as well as address social isolation and loneliness through international and multidisciplinary research teams. ■ PRIORITY 4: Enable enhanced mechanisms to share best practices and barriers to independent and connected living.
INCLUSIVE LIVING
<ul style="list-style-type: none"> ■ PRIORITY 1: Understanding marginalisation connected to ageing and promoting targeted and co-created inclusive solutions. ■ PRIORITY 2: Sharing tools and methodology, and practices in the field of Learning Health Systems to reduce health disparities in elderly populations. ■ PRIORITY 3: Enhance virtual care by identifying solutions through understanding barriers as well as opportunities in digital literacy of care professionals and end users. ■ PRIORITY 4: Tools and methodologies for the engagement and active involvement of the elderly and specific groups (such as marginalized groups, new ageing groups, etc.). ■ PRIORITY 5: Integrate data generated from next generation internet technologies (e.g., AI, IoT, robotics) to inform evidence-based decision making.

1.1.2 Preliminary Insights for Cooperation from the Policy Makers

Based on the above-mentioned priorities, policy makers representing the relevant funding agencies from the [1st PLC meeting](#) provided their feedback and identified areas of major interest. These specified core areas were either domains at the national/regional level that were previously addressed or funded (in line with current policy agendas), or as topics with potential for R&I initiatives at the international level.

As a first step towards the enhancement of international cooperation in the field of Digital Health for AHA, the first PLC meeting produced a set of **preliminary insights for cooperation** around three main Priority-areas identified by the IDIH Expert Groups:

- EG Inclusive Living – Priority 1: *Understanding marginalisation connected to ageing and promote targeted and co-created inclusive solutions.*
- EG Inclusive Living – Priority 2: *Sharing tools and methodology, practices in the field of LHS (learning health systems) to reduce health disparities in ageing populations.*
- EG Preventive Care – Priority 2: *Development of international standards and procedures for interoperable outputs of wearable (and all) technologies.*

1.2 The IDIH Thematic Webinar on Inclusive Design of Digital Solutions for AHA

Inclusive Design of Digital Solutions for Active and Healthy Ageing was identified as a crucial aspect encompassing many of Priorities identified by the Experts and, therefore, was selected as a relevant subject to be further addressed and deepened during a dedicated webinar, conceived as a public event.

This event was **launched during the IDIH Stakeholders Event** on 4 October 2021 that gathered all Experts and users engaged in the IDIH Digital Health Transformation Forum, to provide updates on current project findings and brief on the upcoming initiatives towards the co-development of the Roadmap (D3.7). Moreover, the participants were asked to provide their comments about the sustainability of the IDIH Forum during a co-creation session.

This IDIH Stakeholders Event was a significant moment for the Forum, as not only were the main results of the four EGs were presented to stakeholders and users, but the future of the Forum beyond the project was discussed, which served to reinforce the Experts’ investment in the project and tied them to a common achievement.



Held one month later, on 5 November 2021, the **Thematic Webinar: Inclusive Design of digital solutions for AHA**, then, was presented as a key step in the path outlined to develop the Roadmap, the final project outcome. The webinar was focused on innovative approaches and methodologies for the inclusive design of digital solutions

for Active and Healthy Ageing. The webinar addressed several critical issues, such as end users’ participation in the design process as well as the methodologies and approaches to address the needs of the older people in this pipeline. The event targeted engineers, end user representatives,

practitioners, anthropologists, sociologists, and others involved in the development process of systems and tools for older persons.

AGENDA	
14.00 – 14.15	Welcome and introduction <i>Lead by the IDIH Coordinator</i>
14.15 – 14.30	Inclusive Design for AHA and the Social Determinants of Health <i>Prof. Gloria Gutman, Gerontologist, Professor/Director Emerita, Dept. of Gerontology/Gerontology Research Centre at Simon Fraser University Vancouver Campus</i>
14.30 – 14.45	Accessibility of digital solutions for AHA <i>Dr. Jose Martinez-Usero, Senior project manager at Digital Europe</i>
14.45 – 15.00	Inclusive Digital Design for Inclusive Ageing <i>Dr. Matthew Lariviere, Lecturer in Social Policy at the University of Bristol</i>
15.00 – 16.00	Q&A session, Round table and discussion with the participants <i>Lead by ATC partner of the IDIH project</i>

Figure 2: Agenda of the IDIH Webinar (November 5, 2021)

The keynote speakers – specified in the agenda above (Figure 1) – underlined the priorities to address, the vision to embrace, and the barriers to overcome to integrate inclusive design. Figure 2 below outlines an overview of the key takeaways from the Webinar’s open discussion among the speakers and a wider audience (about 34 attendees from the [IDIH Community](#)).

PRIORITIES	VISIONS	BARRIERS
<ul style="list-style-type: none"> Digital solutions have to consider digital divide among senior population Digital solutions have to consider different social, gender and cultural determinants of health Long-term care should be addressed at systemic level User involvement should start at the beginning of design process 	<ul style="list-style-type: none"> Seniors are becoming increasingly techno-sophic The individuals should be at the centre of technology design Digital solutions can address social exclusion Technology should enable or facilitate new ways to meaningfulness Technology should be accessible, affordable, appropriate, attractive, acceptable, alternative, flexible 	<ul style="list-style-type: none"> High cost of digital solutions' customisation Technology does not have to overcompensate real or imagined physical or social losses New technology brings a high risk of privacy violation Free markets may prevent system or data interoperability in healthcare 

Figure 3: Key Results from the Open Discussion in the IDIH Webinar (November 5, 2021)

2 The 3rd Expert Group Workshop's | Aims and Methodology

The 3rd EG Workshop intended to summarise past findings and outcomes and establish the commonalities between the prior EGs' results to further develop the *Roadmap: Towards the Enhancement of International Cooperation for Digital Health for AHA*, foreseen by April 2022 as a key and final outcome of the project.

In particular, the workshop's objectives were:

- To **clarify the findings** from the 1st and the 2nd IDIH EG Workshops, starting from the previously-identified priorities for international cooperation in the field of Digital Health for AHA,
- To further identify and assess **commonalities** between the findings of the different EGs,
- To identify **barriers** (such as socio-economic, political, technological and legal) that prevent international collaboration in the IDIH strategic regions on the Priority topics identified,
- To present the trends in the AHA domain at both regional and international levels, highlighting **opportunities** for international cooperation in the field of Digital Health for AHA,
- To envisage the **impacts** of enhanced international cooperation on the field of Digital Health for AHA.

As opposed to the previous EG Workshops, the 3rd EG Workshop was conducted as a collective of all the Experts from the *Preventive Care, Integrated Care, Independent & Connected Living and Inclusive Living* Groups to broaden the scope of the discussion and trace the results gathered from the individual EG, with the ultimate goal of building **a shared vision of how to enhance international cooperation in the field of Digital Health for AHA.**

To reach the Workshop's goals and ensure effective collaboration between the EGs, an *ad hoc* co-creation methodology was designed.

2.1 Methodology and Tools

All the participants were guided throughout the Workshop facilitated by APRE with support from the IDIH EGs facilitators¹. The participants provided their inputs/feedback in three working sessions: **one co-creation session** held *virtually* and **two follow-up sessions** using *online forms*.

In particular, with consideration for the Workshop's aims and the constraints of an online event with a diverse and large audience, the facilitators opted to use [Google Jamboard](#) and [slido.com](#) as tools for the first co-creation session, while the second and the third follow-up sessions used two Microsoft Forms that were distributed among the IDIH Experts. The same two Microsoft Forms were also distributed amongst the Users Consultation Group members to gain insight into their views on the IDIH

¹ EGs facilitators at the time of the 3rd EG Workshop were: Bruno Mourenza – APRE (Preventive Care EG), Francisco Javier Casado Hebrard – S2i (Integrated Care EG), Matthew Holt – Catalyst (Independent and Connected Living EG), George Zisis – ATC (Inclusive Living EG).

Experts' first findings in the co-creation session and let them contribute in the reflection about impacts, barriers and opportunities.

To achieve a *shared vision* of how to enhance international cooperation in the field of Digital Health for Active and Healthy Ageing (AHA) and, thus, contribute to the elaboration of the *Roadmap* (D3.7)², the overall methodological approach was implemented in four-phases:



1. Clustering

A preliminary *Cluster analysis* was carried out by APRE among the eighteen Priorities gathered from the 2nd EG Workshop (May 2021), starting from a set of *keywords* previously assigned to each Priority as representative of the domains concerned. By measuring the recurrence of each keyword among the Priorities and assessing their reciprocal prevalence, three groups of keywords resulted. Therefore, **three Clusters of Priorities** were identified, each one representing a common area of intervention.

Results of the cluster analysis of Priorities based on keywords – CLUSTER 1

KEYWORDS RECURRENCE IN THE PRIORITIES:

- AI/machine learning - PC1, PC3, ICL2
- (Home) monitoring - PC1, PC6, PC5
- Data analysis - PC1, PC3
- Common predictive tools – PC1
- Wearables – PC2, PC5
- Human Digital Twin – PC3
- Unobstructive data generation – IC1
- Critical health parameters – IC1
- (Healthcare professionals'/Caregivers/Providers) engagement – PC5, IC1, IC5
- Technology usage – IC1

EG Legend

PC = Preventive Care
 IC = Integrated Care
 ICL = Independent and Connected Living
 IL = Inclusive Living

- PC1: Forward/backward longitudinal study and big data analysis to better understand the determinants of healthy ageing and the trajectory towards the "un-healthy", from normality to the presence of disease.
- PC2: Development of international standards and procedures for interoperable outputs of wearable (and all) technologies
- PC3: Data analysis modelization at different levels, such as: determinants of wellbeing, diseases...
- PC5: Creation of eco-systems for open innovation in wearables: co-creation and co-design Academia/Industry/Consumers/Institutions.
- PC6: Support learning health and wellness and social systems through the access to data, procurements, etc.
- ICL2: Create a standardized framework for International Data Governance & Security (Big Data, Meta Data and Curated Data) based on interoperability and sharing patient-data and patient generated data.
- IC1: Digital inclusion: inclusive healthcare system using digital tools (Digital literacy, access to infrastructure...).
- IC5: Co-design and co- development with the involvement of caregivers across different typologies and disciplines (i.e., physiotherapists and doctors) to tackle gaps and barriers.

Figure 4: Results of the Cluster Analysis (Cluster 1) in Preparation for the 3rd EG Workshop

² This project deliverable (D3.7) is due by April 2022, as a key and final outcome of the project addressing the Policy Makers from the 6 IDIH Regions with recommendations by the Experts and concrete steps to enhance international cooperation in the field of Digital Health for AHA.

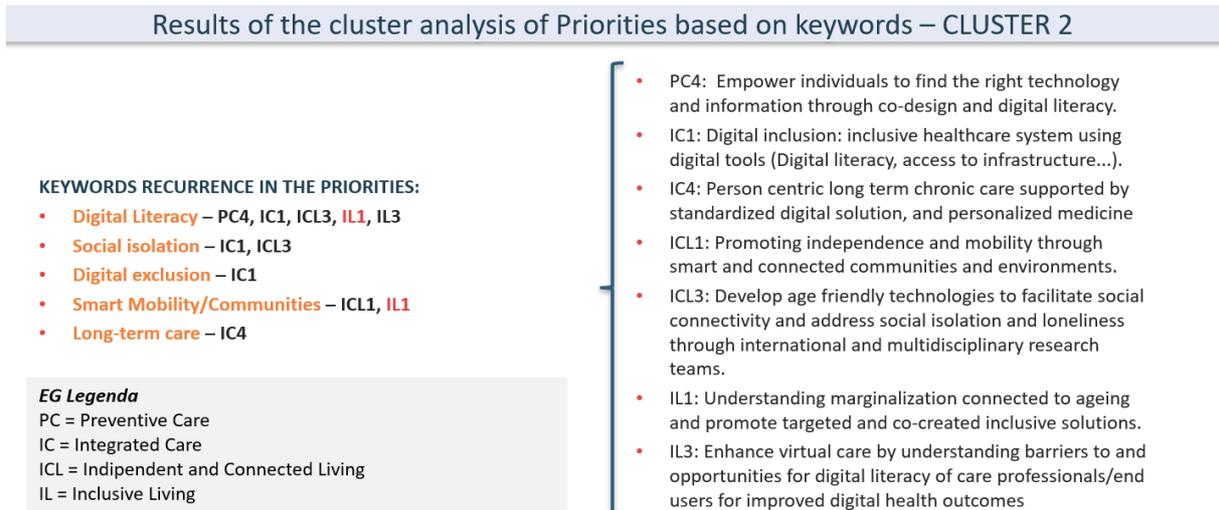


Figure 5: Results of the Cluster Analysis (Cluster 2) in Preparation for the 3rd EG Workshop

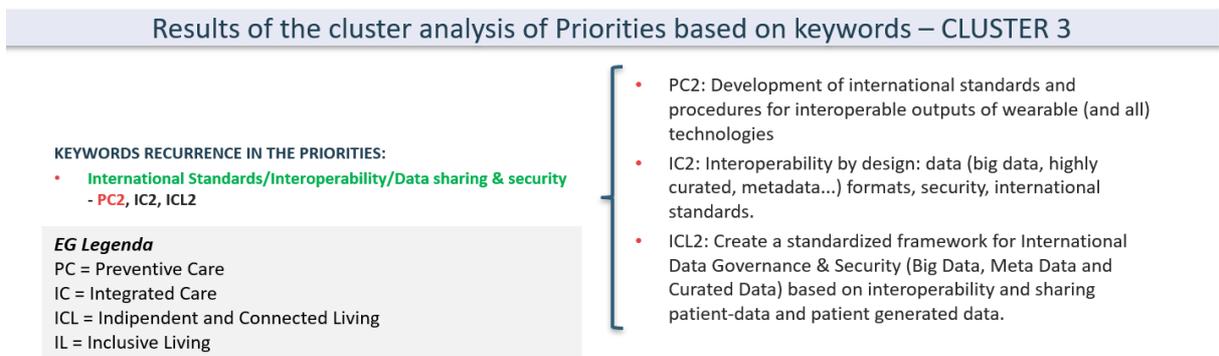


Figure 6: Results of the Cluster Analysis (Cluster 3) in Preparation for the 3rd EG Workshop

As the basis for the co-creation phase during the 3rd EG Workshop, this preliminary exercise also took into account the first attempt of synthesis made right after the 2nd EG Workshop by the EGs Facilitators (see D3.4, part 4. *Common Set of Priorities for the IDIH Expert Groups*) as well as the major areas of interest highlighted by the policy makers during the 1st IDIH Programme Level Cooperation meeting (see D2.5, part 2.6 *Conclusions and Next Steps*)³.

2. Reviewing

The second phase began with the EGs facilitators collecting relevant materials that were then disseminated to the Experts as preparation for the 3rd EG Workshop. These [background materials](#) were consolidated into a **Briefing Note** for the Experts, providing a set of key messages summarising previous IDIH findings along with publications and policy documents relevant for the 3rd EG

³ The overview of the 3 Clusters highlights in red the Priorities identified by the Policy Makers as areas of major interest (see D2.5, part 2.6 Conclusions and next steps) .

Workshop’s open discussion. This Briefing Note was shared with all the Experts one week before the 3rd EG Workshop. Further information regarding this Briefing Note can be found in Section 2.2.1.

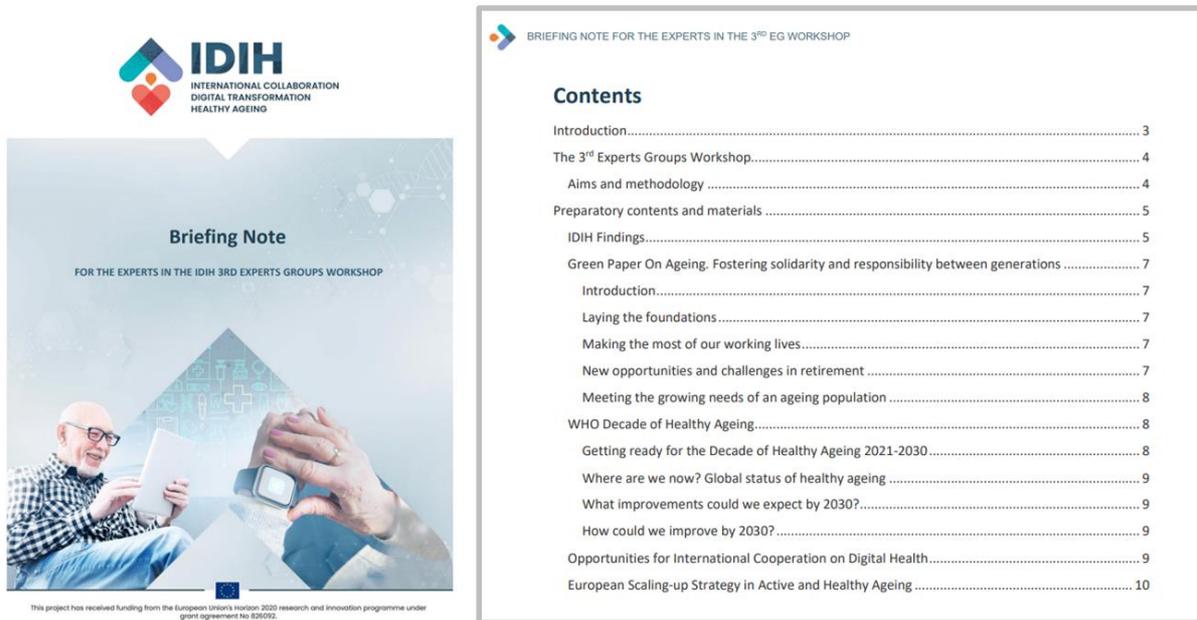


Figure 7: Briefing Note for the Experts in the 3rd EG Workshop (Table of Contents)

3. Co-Creation

Subsequently, the Consortium directly engaged the IDIH Experts in discussions on the results of the Cluster analysis and the background materials provided to them. Experts were engaged on 19 November 2021 in a *virtual* co-creation session **to consolidate** the results of the Cluster analysis by working in three sub-sessions, each one focusing on a Cluster, with the final goal of developing a **shared description of three new Priority Topics** (out of the original eighteen Priorities from the 2nd EG Workshop).

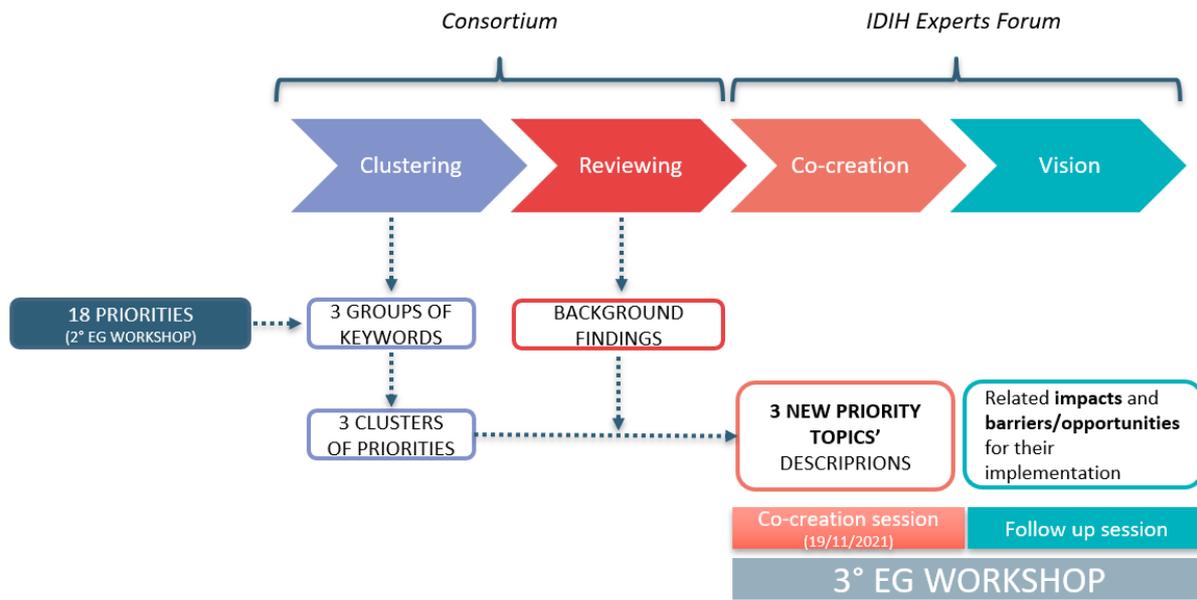


Figure 8: Methodological Approach to the 3rd EG Workshop

The **Facilitator Notes**, designed by APRE and distributed among the EGs facilitators (for internal use) prior to the Workshop, explained in detail the methodological approach to the Workshop and its agenda. The Notes also appointed specific roles to the IDIH Team as well as provided guidelines and inputs for those involved.

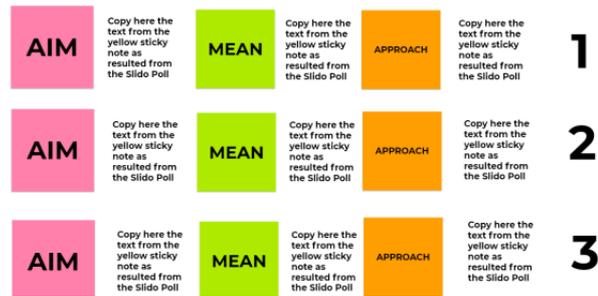
The co-creation session of the 3rd EG Workshop was facilitated by APRE who guided the Experts in the three sub-sessions, assigning each one a Cluster to develop a Priority Topic description, as follows:

- 1. Analysis the Priorities** within the Cluster.
- 2. Assessment of the Priorities as AIMS/MEANS/APPROACHES:** Experts were invited to rank each Priority in slido.com (an example from sub-session 1/Cluster 1 on AIMS, here follows), assessing to what extent these Priorities could be considered as aims, means for implementation, or methodological approaches of the Priority Topic. **The top three** results from each ranking among AIMS/MEANS/APPROACHES was then considered for the development of the final Priority Topic



Figure 9: Slido Poll Results of the *Priority Setting* Exercise Related to Cluster 1 Priorities [example]

In this way, the poll resulted in **three main sequences of AIM/MEAN/APPROACH**, which were reported again on Google Jamboard for discussing the survey's outcomes.



4. Voting on the most cohesive sequence of AIMS/MEANS/APPROACHES: participants were asked to get back to slido.com and vote for the most cohesive sequence AIM/MEAN/APPROACH included in the poll in real time.

5. Development of a shared description of the Priority Topic: based on the poll results (one single sequence of AIMS/MEANS/APPROACHES), which were reported and commented on Google Jamboard, the participants, with the support of the facilitators, started drafting the Priority Topic description according with the syntax structure of AIM/MEAN/APPROACH: *To (e.g., support, contribute, etc.) through ...based on ...*

As a result of this live co-creation session, **three Priority Topics** were agreed and described by the Experts.

4. Vision

This **follow-up session** was implemented remotely between November 2021 and January 2022 thanks to the use of two Microsoft Forms aimed to first validate (follow-up phase one) the three Priority Topics developed during the co-creation session – both among the Experts and the members of the UCG – and then (follow-up phase two) to identify and classify the **impacts** of such Priority Topics, as well as the **barriers** and **opportunities** that prevent or favour their implementation at international/regional level. Subsequently, the PESTEL model (outlined below) was considered as a basis for the reflection and as an avenue Experts could use to provide their inputs for the identification of any political, economic, social, technological, environmental and regulatory barrier or opportunity for each of the three Priority Topics developed.

About the PESTEL Model: PESTEL is an acronym for *Political, Economic, Social, Technological, Environmental and Legal*, and refers to a framework to support full situational analysis through the identification of the macro (external) factors that can impact an ecosystem. The following aspects are taken into account when a PESTEL analysis is implemented:

- **Political Factors:** *These determine the extent to which government and government policy may impact an organisation or a specific ecosystem. This would include political policy and stability as well as trade, fiscal, and taxation policies.*
- **Economic Factors:** *An economic factor has a direct impact on the economy and its performance, which in turn directly impacts the organisation and its profitability. Factors include interest rates, employment or unemployment rates, raw material costs, and foreign exchange rates.*
- **Social Factors:** *The focus here is on the social environment and identifying emerging trends. This helps to further understand target groups' needs and wants in a social setting; factors include changing family demographics, education levels, cultural trends, attitude changes, and changes in lifestyles.*

- **Technological Factors:** Technological factors consider the rate of technological innovation and development that could affect an ecosystem. Factors could include changes in digital or mobile technology, automation, research, and development. There is often a tendency to focus on developments only in digital technology, but consideration must also be given to new methods of distribution, manufacturing, and logistics.
- **Environmental Factors:** Environmental factors are those that are influenced by the surrounding environment and the local ecological impacts. Factors include climate, recycling procedures, carbon footprint, waste disposal, and sustainability.
- **Legal Factors:** It is necessary to understand what is legal and allowed within the ecosystem under analysis, this also means considering any change in legislation and the impact this may have. Factors include employment legislation, consumer law, health and safety, and international as well as trade regulation and restrictions. Political factors do cross over with legal factors; however, the key difference is that political factors are led by government policy, whereas legal factors must be complied with.

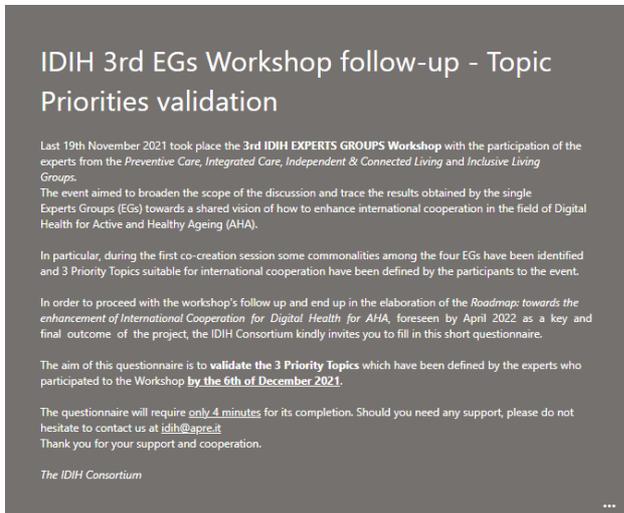


Figure 12: Cover of the Microsoft Form Used in the Follow-up (Phase One) of the 3rd EG Workshop

The **Microsoft Form** used for the phase one of the follow-up session was elaborated by APRE with the aim to:

- **Validate** the three Priority Topics with all the Experts, including those who could not attend the event and the UCG members.
- Gather further inputs and suggestions from all the Experts in order to eventually **improve** the three Priority Topics.
- Collect any recent publication or relevant study **supporting** the validity of the three Topics as priorities at regional/international level.

Once the three Priority Topics were validated and adjusted, the **Microsoft Form** for the phase two was developed and distributed to all Experts who were asked to:

- Identify the **target groups** most affected by the three Priority Topics.
- List the expected **impacts** that each Priority Topic will have on each target group.
- Specify the level of occurrence (short/medium/long term) for each expected impact.
- Collect any recent publication or relevant study **supporting** the validity of the identified expected impacts.
- List the political, economic, social, technological, environmental, and regulatory **opportunities** and **barriers** associated with the three Priority Topics.

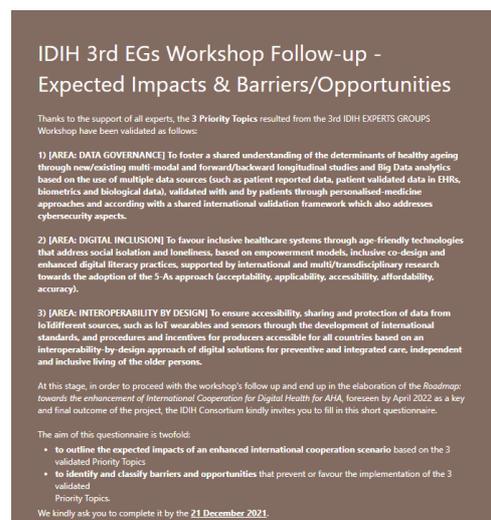


Figure 13: Cover of the Microsoft Form Used in the Follow-up (Phase Two) of the 3rd EG Workshop

- Specify the *likelihood* level (low/medium/high) of each opportunity or barrier identified.
- Collect any recent publication or relevant study *supporting* the validity of the barriers and opportunities identified.

For both forms, EGs facilitators played a key role in assisting the Experts in the completion of the surveys.

2.2 Preparatory Phase

Following several **preparatory meetings prior to the Workshop** with the WP3 leader (ATC) and the Project Coordinator (S2i), several introductory materials were consolidated and distributed to EGs facilitators and IDIH Experts.

2.2.1 The Briefing Note for the IDIH Experts in the 3rd Experts Groups Workshop



In particular, besides the **Facilitator Notes** (developed by APRE for internal use), a **Briefing Note** was drafted by the EGs facilitators and distributed in advance to introduce the aim and methodology of the 3rd EG Workshop to all IDIH Experts and provide a set of key messages from previous IDIH findings as well as a collection of relevant publications and policy documents relevant for the open discussion to be held on November 19, 2021.

It was important that all the Experts were fully aware not only of the activities and findings in each group, but also of the main trends in the Digital Health & Ageing domains, supported by key policy drivers, which were presented to the Experts as follows.

2.2.1.1 Key Policy Drivers

To ensure the alignment of all the Experts, some key messages from leading policies within the EU and at the international level were selected to complement the discussion.

Green Paper On Ageing

Demography represents a hot topic on the EU policy agenda: the Commission's June 2020 [report on the impact of demographic change](#) showed that in the last 50 years, life expectancy at birth has increased by about ten years for both men and women.

In this framework, the “[Green Paper on Ageing. Fostering solidarity and responsibility between generations](#)” was adopted on 27 January 2021 to launch a **broad policy debate** on the challenges and opportunities of Europe's ageing society. The paper outlined the impact of this pronounced demographic trend across the economy and society, followed by the long-term vision for rural areas that also considers the question of depopulation, in compliance with the UN 2030 Agenda for Sustainable Development and UN Decade for Healthy Ageing.



WHO Decade of Healthy Ageing

The United Nations Decade of Healthy Ageing (2021–2030) is a global collaboration, aligned with the last ten years of the Sustainable Development Goals, that brings together governments, civil society, international agencies, professionals, academia, the media, and the private sector to improve the lives of older people, their families, and the communities in which they live.

The Briefing Note highlighted the **Decade Action Areas** and the **Decade Enablers** and presented the Action Plan for its implementation, also with the development of other communication materials to facilitate the comprehension and the domains of this UN initiative, such as this [IDIH Infographics](#).

UN Decade of Healthy Ageing

2021-2030

Decade Action Areas

Age-friendly environments
Physical, social and economic environments are important determinants of healthy ageing

Combatting Ageism
The narrative around age negatively impacts on old adults and their well-being

Integrated Care
Old people require access to good quality and essential services

Long-term Care
Long-term-care systems enable old people to live a consistent life

Decade Enablers

Voice and engagement
Give voice and actively engage older people is crucial to give them visibility

Leadership and capacity building
Governance has to design specific policies and foster capacity-building systems

Connecting stakeholders
Multi-stakeholder approach leverages new knowledges and resources

Strengthening research, data and innovation
Research can drive national policies and actions

UN DECADE OF HEALTHY AGEING

10-YEARS ACTION PLAN

The Plan aims to achieve Healthy Ageing the possession of full functional ability for well-being

<p>-27% MORE WOMEN</p> <p>14% OF OUR PEOPLE CANNOT MEET BASIC NEEDS</p>	<p>We live longer, but with social and economic inequality</p> <p>6 YEARS OF LIFE FOR HIGHLY EDUCATED</p>	<p>+34% MORE PEOPLE BY 2030</p> <p>+22 YEARS OF LIFE EXPECTANCY IN 2020</p>	
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Change the approach to age
Deliver person-centered care

Foster old people ability
Provide long-term care

To foster healthy ageing the Action Plan focuses on **4 AREAS OF ACTION** to be implemented by Member States, WHO Secretariat and National and International Partners

<p>PARTNERSHIP FOR CHANGE</p> <p>A platform will be established to listen to diverse voices, nurture leadership and build capacity, connect diverse stakeholders, strengthen data, research and innovation</p>	<p>MONITORING MECHANISM</p> <p>A set of indicators by process and outcomes will provide key information for planning, investment and implementation</p>
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GOVERNANCE

The Plan will establish a strong governance to support a whole-society response

Secretariat at WHO headquarters to coordinate country, region and headquarters level

Committee chaired by WHO with representations from regions and experts

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 826092.

22

Opportunities for International Cooperation on Digital Health



Centre for European Policy Studies (CEPS) Researchers Nadina Iacob and Felice Simonelli produced the policy brief “[Opportunities for International Cooperation on Digital Health](#)” as a part of ‘Task Force 4 – Digital Transformation’ organised by The Think20 (T20), the official engagement group of the G20. The group serves as the ‘ideas bank’ of the G20 and aims to provide research-based policy recommendations to G20 leaders. It was finalised as part of T20 Italy in advance of Italy’s hosting of the annual G20 summit from 30–31 October 2021.

The document argues for action in three key areas: establishing technical and legal building blocks, gaining end users’ trust, and fostering research, innovation and competition.

European Scaling-up Strategy in Active and Healthy Ageing

A number of good examples in the field of AHA were mapped through Europe by the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) over three years (2012–2014). A comprehensive strategy (European Scaling-up Strategy in Active and Healthy Ageing) is needed to scale-up the most innovative features to expand into other European contexts which could benefit from the predecessors. The EIP on AHA developed a document ([European Scaling-up Strategy in Active and Healthy Ageing](#)) proposing a 5-step framework for developing an individual scaling up strategy.

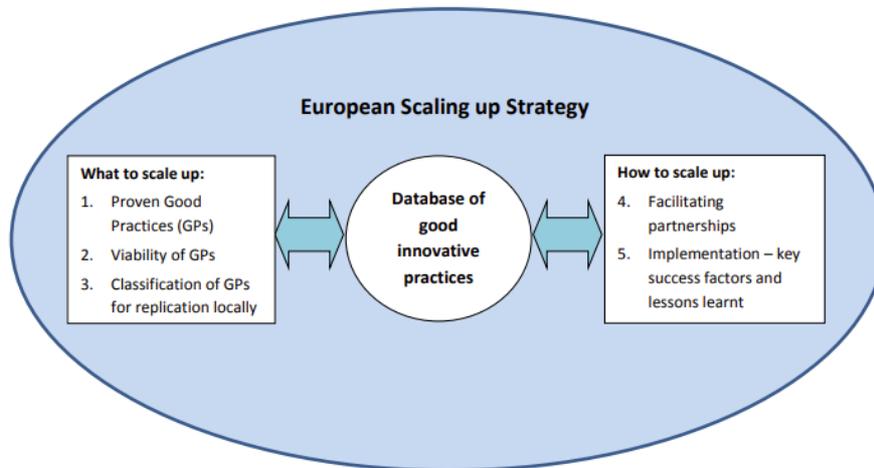


Figure 14: [European Scaling-up Strategy in Active and Healthy Ageing](#) (Overall Approach)

3 The 3rd Experts Groups Workshop’s | Works and Results

3.1 The Online Event

3.1.1 Agenda

The agenda of the Workshop (19 November 2021) was structured to recap all previous achievements and outcomes of the project, to reiterate key messages from crucial policy documents, and to conduct three sessions, one dedicated to co-creation and two to introduce the follow-up sessions, which took place remotely after the Workshop using *online* forms. The timing previously set by this agenda, indeed, was mostly dedicated to the co-creation session and, therefore, the two final topics were just briefly addressed in anticipation of the follow-up sessions of the Workshop (*online* forms).

AGENDA		
14.00 – 14.10	Welcome and Introduction <i>Kristin Dallinger, Steinbeis, IDIH Project Coordinator</i>	
14.10 – 14.30	Background and starting topics for discussion: presentation of the <i>Priorities</i> identified by the IDIH Experts Groups. <i>George Zissis, ATC</i>	
14.30 – 15.50	Consolidating Priority Topics: open discussion in 3 sub-sessions for the identification of commonalities among the <i>Priorities</i> and definition of a shared set of <i>Priority Topics</i> suitable for international cooperation. <i>Moderators: Mathilde De Bonis, Bruno Mourenza, APRE</i>	<i>Co-creation session</i>
15.50 – 16.00	Break	
16.00 – 16.30	Exploring barriers and opportunities: open discussion for the identification and classification of barriers/opportunities that prevent/favour the implementation of the <i>Priority Topics</i> identified. <i>Moderators: Mathilde De Bonis, Bruno Mourenza, APRE</i>	<i>Introduction to the Follow-up session</i>
16.30 – 17.00	Envisage impacts: outlining the expected impacts of an enhanced international cooperation scenario based on the <i>Priority Topics</i> identified. <i>Moderators: George Zissis, ATC - Mathilde De Bonis, APRE - Kristin Dallinger, Steinbeis.</i>	

Figure 15: Agenda of the online event (19 November 2021), as part of the 3rd EG Workshop

The Workshop was opened by S2i, the IDIH Project Coordinator, who welcomed the Experts and introduced the aims of the Workshop, as part of the activities of the IDIH Experts Forum and its path towards the development of a *Roadmap towards the enhancement of International Cooperation for Digital Health for AHA*, as in the image below.

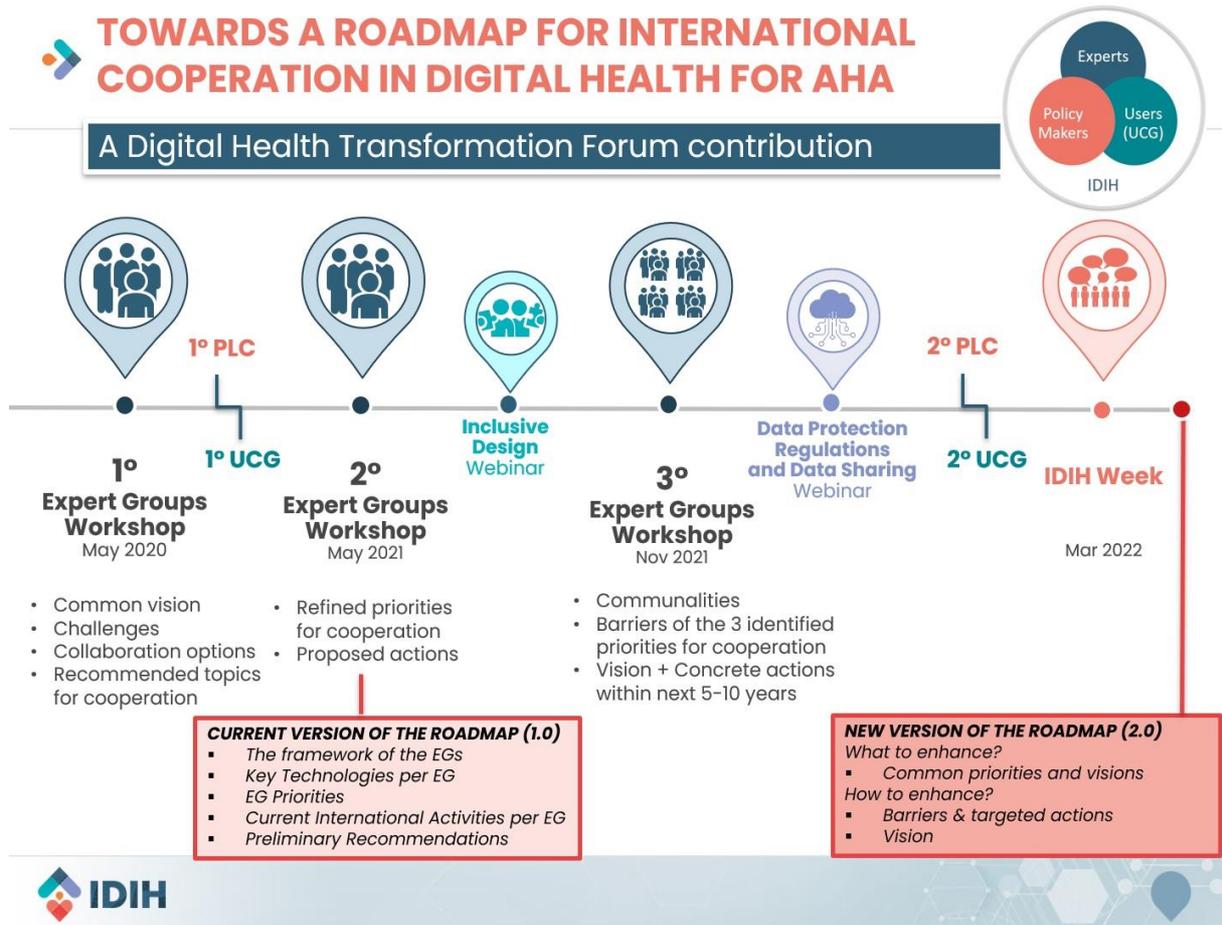


Figure 16: IDIH Path towards a Roadmap for International Cooperation in Digital Health for AHA

The WP3 leader, ATC, highlighted the previous findings of the IDIH Experts Forum, as starting points for the reflection and the works within the current Workshop’s three co-creation sessions, by focusing on the Priorities identified as suitable for international cooperation within the 2nd EG Workshop. Experts were finally reminded about the preparatory materials shared in the Briefing Note.

Lastly, APRE coordinated and managed the first co-creation session and its sub-sessions, together with S2i, ATC and Catalyst who supported the exercise by stepping into the discussion, highlighting specific aspects to be taken into account (for instance, UN Decade Areas, outcomes from IDIH Webinars etc.), encouraging the Experts in their reflection leveraging on their specific expertise, and helping with any other supporting actions.

3.1.2 Participants

The **IDIH Experts** who attended the online event (19 November 2021) of the 3rd EG Workshop were:

1. AJ Chen (USA), Inclusive Living EG
2. Emily Lee (South Korea), Integrated Care EG
3. George Demiris (USA), Independent and Connected Living EG Chair
4. Giovanni Saggio (Europe), Preventive Care EG Chair
5. Guilan Kong (China), Independent and Connected Living EG
6. Hirohisa Hirukawa (Japan), Independent and Connected Living EG
7. Lilian Hung (Canada), Inclusive Living EG
8. Matteo Antonio Melideo (Europe), Independent and Connected Living EG
9. Matthew Holt (USA), Independent and Connected Living EG
10. Steven Charlap (USA), Preventive Care EG
11. Yanchun Zhang (China), Integrated Care EG

While the following participants attended from the **IDIH Team**:

1. Bruno Mourenza, APRE
2. Elizabeth Brown, Catalyst
3. Eva Fadil, G.A.C. Group
4. Federica D'Acunto, APRE
5. Francisco Javier Casado Hebrard, S2i
6. George Zisis, ATC
7. Kristin Dallinger, S2i
8. Mathilde De Bonis, APRE
9. Stephanie Morello Fenouillet, G.A.C. Group

3.1.3 Results of the Co-creation Session on *Consolidating Priority Topics*

According with the [methodology](#) described, Experts were asked to express their preferences with respect to the eighteen Priorities identified by each EG and clustered by assessing them as AIMS/MEANS/APPROACHES towards advancements in the AHA domain through Digital Health, in order to end up with three Priority Topics' descriptions to use as a basis for the development of the Roadmap (D3.7). The results of this co-creation session its related Priority Cluster are subsequently reported per each working session.

Sub-session 1 | Cluster 1

The Experts in this session identified the following top three priorities as AIMS, MEANS and APPROACHES.

Top three **AIMS**:

- *Create a standardized framework for International Data Governance & Security (Big Data, Meta Data and Curated Data) based on interoperability and sharing patient-data and patient generated data.*

- *Forward/backward longitudinal study and big data analysis to better understand the determinants of healthy ageing and the trajectory towards the "un-healthy", from normality to the presence of disease.*
- *Creation of eco-systems for open innovation in wearables: co-creation and co-design Academia/Industry/Consumers/Institutions.*

Top three **MEANS**:

- *Support learning health and wellness and social systems through the access to data, procurements, etc.*
- *Create a standardized framework for International Data Governance & Security (Big Data, Meta Data and Curated Data) based on interoperability and sharing patient-data and patient generated data.*
- *Forward/backward longitudinal study and big data analysis to better understand the determinants of healthy ageing and the trajectory towards the "un-healthy", from normality to the presence of disease.*

Top three **APPROACHES**:

- *Co-design and co-development with the involvement of caregivers across different typologies and disciplines (i.e., physiotherapists and doctors) to tackle gaps and barriers.*
- *Support learning health and wellness and social systems through the access to data, procurements, etc.*
- *Create a standardized framework for International Data Governance & Security (Big Data, Meta Data and Curated Data) based on interoperability and sharing patient-data and patient generated data.*

Once the top three AIMS, MEANS and APPROACHES were designated, Experts were asked to connect each AIM with its respective MEAN and APPROACH, to formulate three different sequences of AIM/MEAN/APPROACH among which the participants then selected the one they deemed most logical.

According to the results, the **best, logical sequence of AIM, MEAN and APPROACH** was:



At this point, stimulated by inputs and questions raised by the facilitators, a brainstorming session then began to formulate the first Priority Topic description. Some opinions emerged from the discussion which were then integrated into the final phrasing of the Priority such as:

- Adoption of a personalised medicine approach,

- Need to create a common framework to define what type of data should be included (e.g., patient-reported data, biometric data, biological data etc.) to design a precise profile of the patient,
- Data governance and security represent a tool rather than an aim to be achieved,
- A standardized framework should be designed at the international level and requires a common understanding of data sharing and interoperability regulations,
- The final scope of Healthy Ageing should be primary prevention.

The final result was the following:

Priority Topic Description 1 [Area: Data Governance]

To foster a shared understanding of the determinants of healthy ageing through multi-modal and forward/backward longitudinal studies and Big Data analytics based on the use of multiple data sources (such as patient reported data, patient validated data in EHRs, biometrics and biological data), validated with and by patients through personalised-medicine approaches and according with a shared international validation framework.

Sub-session 2 | Cluster 2

The Experts in this session have identified the following top three priorities as AIMS, MEANS and APPROACHES.

Top three **AIMS**:

- *Digital inclusion: inclusive healthcare system using digital tools (Digital literacy, access to infrastructure...).*
- *Enhance virtual care by understanding barriers to and opportunities for digital literacy of care professionals/end users for improved Digital Health outcomes.*
- *Develop age friendly technologies to facilitate social connectivity and address social isolation and loneliness through international and multidisciplinary research teams.*

Top three **MEANS**:

- *Develop age friendly technologies to facilitate social connectivity and address social isolation and loneliness through international and multidisciplinary research teams.*
- *Empower individuals to find the right technology and information through co-design and digital literacy.*
- *Enhance virtual care by understanding barriers to and opportunities for digital literacy of care professionals/end users for improved Digital Health outcomes.*

Top three **APPROACHES**:

- *Empower individuals to find the right technology and information through co-design and digital literacy.*
- *Promoting independence and mobility through smart and connected communities and environments.*

- *Digital inclusion: inclusive healthcare system using digital tools (Digital literacy, access to infrastructure...).*

Once the top three AIMS, MEANS and APPROACHES were designated, Experts were asked to connect each AIM with its respective MEAN and APPROACH, to formulate three different sequences of AIM/MEAN/APPROACH among which the participants then selected the one they deemed most logical.

According to the results, the **best, logical sequence of AIM, MEAN and APPROACH** was:



This sequence turned into the Priority Topic 2, with the contribution of the attendees, who emphasized that:

- Access to Internet is a universal human right,
- Digital inclusion and social connectivity should be highlighted as an aim to pursue,
- The 5-A approach, presented also during the Webinar about Inclusive Design (see 1.2) has to be adopted, where the 5-As stands for: acceptability, applicability, accessibility, affordability, accuracy.

Therefore, the first version of the Priority Topic 2 was:

Priority Topic Description 2 [Area: Digital Inclusion]

To favour inclusive healthcare systems through age-friendly technologies that address social isolation and loneliness, based on empowerment models, inclusive co-design and enhanced digital literacy practices, supported by international and multi/transdisciplinary research towards the adoption of the 5-As approach (acceptability, applicability, accessibility, affordability, accuracy).

Sub-session 3

The 3rd sub-session was handled on the base of only three Priorities emerged from the Cluster analysis realised by APRE, as in the yellow sticky notes in the image of the board below.

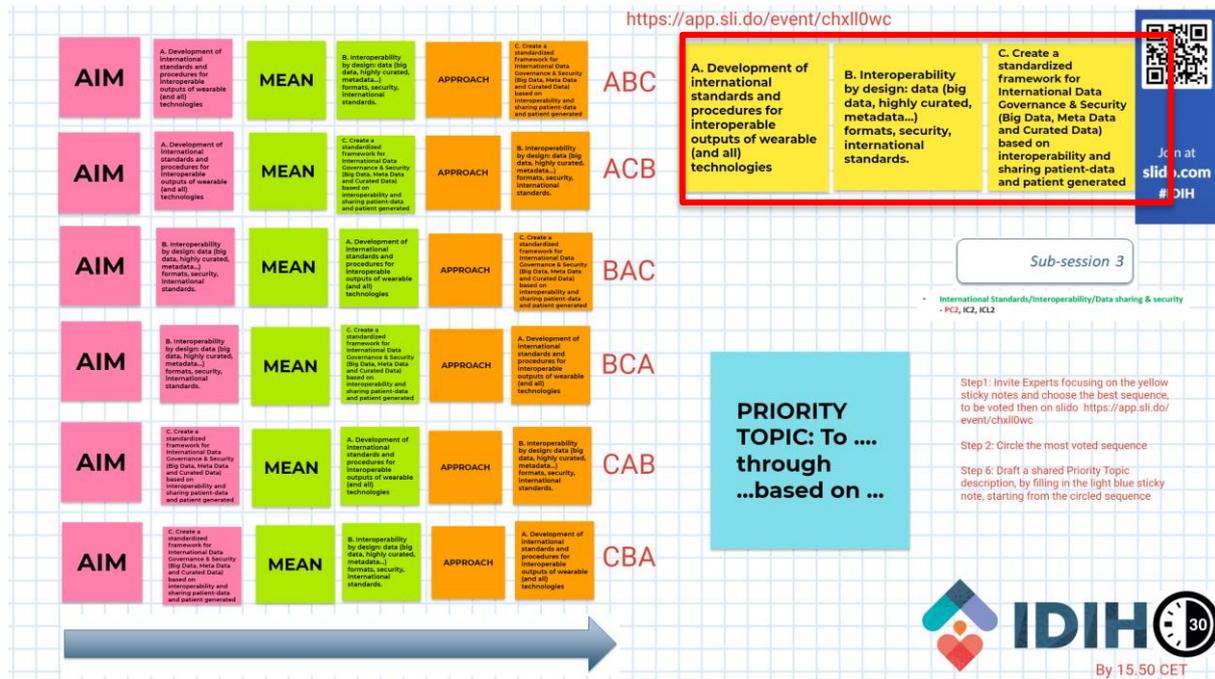


Figure 17: Peculiarities of Sub-session 3 during the Online Event (November 19, 2021)

Therefore, in this case, only six possible combinations of AIM/MEAN/APPROACH were already available and displayed to the participants who voted on their preferred one.

According to the results, the **best, logical sequence of AIM, MEAN and APPROACH** was:



This sequence turned into Priority Topic 3, with contribution of the attendees, who emphasized that:

- It is necessary to specify which data set has to be adopted,
- It is crucial to address each of the four Domains within this Priority,
- Sensors from IoT and wearables can provide useful data.

Therefore, the first version of the Priority Topic 3 was:

Priority Topic Description 3 [Area: Interoperability by Design]

To ensure accessibility, sharing and protection of data from IoT, such as wearables and sensors through the development of international standards and procedures based on an interoperability by design approach of digital solutions for preventive and integrated care, independent and inclusive living of the older persons.

3.2 Follow-up Survey

3.2.1 Phase One: Validation of the Priority Topics' Descriptions

According with the methodology described in [section 2.1](#) (see *Vision*), during the Workshop's follow-up session, all Experts, including those who could not attend the event, were asked to validate the first set of priorities, and provide useful comments and recent relevant publications supporting such priorities and their eventual suggestions for improvement.

By 11 January 2022, **sixteen Experts had participated** in phase one of this follow-up survey as part of the 3rd EG Workshop:

Table 2: List of participants of 3rd EG workshop's follow-up survey phase one

Name and Surname	IDIH Expert Group	Country/Region
AJ Chen	Inclusive Living	USA
Andreas Kremer	Integrated Care	Europe
Andrew Sixsmith	Integrated Care	Canada
Emily Lee	Integrated Care	South Korea
Giovanni Saggio	Preventive Care	Europe
Hirohisa Hirukawa	Independent and Connected Living	Japan
Isabel Van De Keere	Integrated Care	Europe
Kendall Ho	Integrated Care	Canada
Marie-Pierre Gagnon	Independent and Connected Living	Canada
Matteo Melideo	Independent and Connected Living	Europe
Matthew Lariviere	Inclusive Living	Europe
Robyn Tamblyn	Independent and Connected Living	Canada
Steven Charlap	Preventive Care	USA
Ville Salaspuro	Integrated Care	Europe
Yanchun Zhang	Integrated Care	China
Yiqiang Chen	Preventive Care	China

The three Priorities that were the outcomes of the online event of 19 November 2021 were addressed as follows in this phase one of the follow-up.

3.2.1.1 Priority Topic Description 1 [Area: Data Governance] | Validation

[AREA: DATA GOVERNANCE] *To foster a shared understanding of the determinants of healthy ageing through multi-modal and forward/backward longitudinal studies and Big Data analytics based on the use of multiple data sources (such as patient reported data, patient validated data in EHRs, biometrics and biological data), validated with and by patients through personalised-medicine approaches and according with a shared international validation framework.*

Do you validate this Topic as a priority to be pursued at regional/international level (UE/China/Canada/Japan/South Korea/USA)?

[Altri dettagli](#)

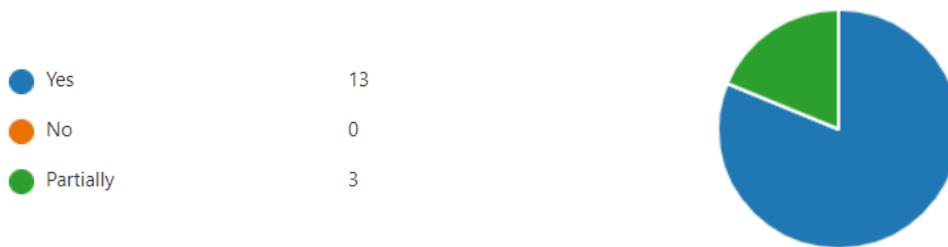


Figure 18: Result of follow-up survey | Validation of Priority Topic 1

Thirteen out of sixteen respondents (81%) validated the Priority Topic description 1, while the remaining three respondents validated it partially, providing the following comments:

- **Comment 1:** *There were multiple EU projects (under healthcare) that can be used for this to further our work so that we do not have to start from scratch.*
- **Comment 2:** *Tied to this theme should be considerations for trust (who owns this data, who can access it, how are analytics used to support individual and systemic healthy ageing options) and cybersecurity (how susceptible are these systems to fraud, DDoS attacks, etc).*
- **Comment 3:** *There is already a great deal invested in scientific investigation of aging cohorts in many countries, for over a decade, so other priorities are more important.*

Other comments supported a full validation of the Priority Topic description one and will contribute to detail the final recommendations by the IDIH Experts to the policy makers, as part of the *Roadmap: towards the enhancement of International Cooperation for Digital Health for AHA* (IDIH Deliverable 3.7), to be released as a final outcome of the project.

However, all these contributions were used to fine-tune the final wording of the Priority Topic description 1, as follows:

Validated Priority Topic Description 1 – Area: Data Governance

To foster a shared understanding of the determinants of healthy ageing through new/existing multi-modal and forward/backward longitudinal studies and Big Data analytics based on the use of multiple data sources (such as patient reported data, patient validated data in EHRs, biometrics and biological data), validated with and by patients through personalised-medicine approaches and according with a shared international validation framework which also addresses cybersecurity aspects.

3.2.1.1.1 Priority Topic Description 1 [Area: Data Governance] | References

IDIH Experts were also asked to list any recent publication or relevant study supporting the validity of such topic as a Priority at the regional/international levels (EU/China/Canada/Japan/South Korea/USA). Below are the references provided:

- A study of the Influential Factors on Satisfaction and Expectation Confirmation about Using Big Data Based Personalized Medical Service 2018.11, <https://innovation.jams.or.kr/co/main/jmMain.kci>
- A Study on the Policy Trends for the Revitalization of Medical Big Data Industry 2020, <https://innovation.jams.or.kr/co/main/jmMain.kci>
- Ministry of Health, Labor and Welfare of Japanese Government published several related reports.
- A running project which demonstrates how the data collection, and the longitudinal studies can be beneficial for a regional community: <https://www.moli-sani.org/>
- How Data Can Improve Healthcare For A Growing Senior Population, <https://www.forbes.com/sites/forbestechcouncil/2021/11/16/how-data-can-improve-healthcare-for-a-growing-senior-population/>
- Global strategy on Digital Health 2020–2025, <https://www.who.int/docs/default-source/documents/g54dhdaa2a9f352b0445bafbc79ca799dce4d.pdf>
- Assessment of the EU Member States’ rules on health data in the light of GDPR – https://ec.europa.eu/health/sites/default/files/ehealth/docs/ms_rules_health-data_en.pdf
- Canadian Longitudinal Study on Aging and DOI: 10.1159/000515835 EVIDENCE Publication Checklist for Studies Evaluating Connected Sensor Technologies: Explanation and Elaboration
- SFU STAR Institute has launched its Key Issues in Aging in the 21st Century digital booklet, <http://www.sfu.ca/starinstitute/resources/research.html>

3.2.1.2 Priority Topic Description 2 [Area: Digital Inclusion] | Validation

[AREA: DIGITAL INCLUSION] *To favour inclusive healthcare systems through age-friendly technologies that address social isolation and loneliness, based on empowerment models, inclusive co-design and enhanced digital literacy practices, supported by international and multi/transdisciplinary research towards the adoption of the 5-As approach (acceptability, applicability, accessibility, affordability, accuracy).*

Do you validate this Topic as a priority to be pursued at regional/international level (UE/China/Canada/Japan/South Korea/USA)?

[Altri dettagli](#)

 Insights

● Yes	14
● No	1
● Partially	1



Figure 19: Result of follow-up survey | Validation of Priority Topic 2

Fourteen out of sixteen respondents (88%) validated the Priority Topic description 2, while the remaining two respondents did not agree with this formulation and provided the following inputs for improvement:

- **Comment 1** (disagreed with description): *It is important to consider Preventive Care not as a direct consequence of digital inclusion. Prevention must be addressed by integrating several other aspects.*
- **Comment 2** (partial disagreement with description): *I would use an international COVID certificate as an example – certain services could be designed from international aspects. We should focus on designing the services that are the simplest and provide the most value at the international level.*

Other comments supported a full validation of the Priority Topic description 2 and will contribute to detail the final recommendations by the IDIH Experts to the policy makers, as part of the *Roadmap: towards the enhancement of International Cooperation for Digital Health for AHA* (IDIH Deliverable 3.7), to be released as a final outcome of the project.

However, all these contributions were used to fine-tune the final wording of the Priority Topic description 2, as follows:

Validated Priority Topic description 2 – Area: Digital Inclusion

To favour inclusive healthcare systems through age-friendly technologies that address social isolation and loneliness, based on empowerment models, inclusive co-design and enhanced digital literacy practices, supported by international and multi/transdisciplinary research towards the adoption of the 5-As approach (acceptability, applicability, accessibility, affordability, accuracy).

3.2.1.2.1 Priority Topic Description 2 [Area: Digital Inclusion] | References

IDIH Experts were also asked to list any recent publication or relevant study supporting the validity of such topic as a Priority at the regional/international levels (EU/China/Canada/Japan/South Korea/USA). Below are the references provided:

- [A Personalized Healthcare Analysis System in Ubiquitous Environment](#). By Mangal Sain, Wan-Young Chung, Hoon-Jae Lee.
- [Social Network Analysis of Elders' Health Literacy and their Use of Online Health Information](#), Healthcare Informatics Research, Healthcare Informatics Research 20th (No.3)
- Smart Homes for Elderly Healthcare—Recent Advances and Research Challenges, Sensors 2017, 17(11), 2496; <https://doi.org/10.3390/s17112496>
- IHI initiative on age-friendly health systems: <http://www.ihl.org/Engage/Initiatives/Age-Friendly-Health-Systems/Pages/default.aspx>
- Ageing in a digital world – from vulnerable to valuable: <https://www.itu.int/en/myitu/Publications/2021/05/17/12/55/Ageing-in-a-digital-world--from-vulnerable-to-valuable>
- AGEWELL Inc
- Beyond the Therapist's Office: Merging Measurement-Based Care and Digital Medicine in the Real World. DOI: 10.1159/000517748

- A study of the Influential Factors on Satisfaction and Expectation Confirmation about Using Big Data Based Personalized Medical Service 2018.11, <https://innovation.jams.or.kr/co/main/jmMain.kci>
- [In Community - Information and Referral Services for Seniors in British Columbia](#). By Karen Lok Yi Wong, Andrew Sixsmith, Leslie Remund.

3.2.1.3 Priority Topic Description 3 [Area: Interoperability by Design] | Validation

[AREA: INTEROPERABILITY BY DESIGN] To ensure accessibility, sharing and protection of data from IoT, such as wearables and sensors through the development of international standards and procedures based on an interoperability-by-design approach of digital solutions for preventive and integrated care, independent and inclusive living of the older persons.

Do you validate this Topic as a priority to be pursued at regional/international level (UE/China/Canada/Japan/South Korea/USA)?

[Altri dettagli](#)

Insights

● Yes	11
● No	0
● Partially	5

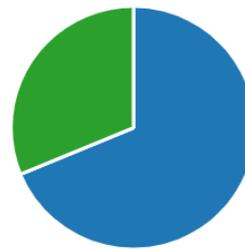


Figure 20: Result of follow-up survey | Validation of Priority Topic 3

Eleven out of sixteen respondents (69%) validated the Priority Topic description 3, while the remaining five respondents validated it partially, arguing their opinion with the following suggestions:

- **Comment 1:** *Why focus just on IoT?*
- **Comment 2:** *The fact that several countries are highlighted because of availability and accessibility of such approaches, but others not included may not, may lead to unintentional inequity.*
- **Comment 3:** *There needs to be incentives for vendors to adhere to standards. A good initiative, as an example, could come from the US Office of the national Coordinator—PHIRE.*

Other comments supported a full validation of the Priority Topic description 3 and will contribute to detail the final recommendations by the IDIH Experts to the policy makers, as part of the *Roadmap: Towards the Enhancement of International Cooperation for Digital Health for AHA* (IDIH Deliverable 3.7), to be released as a final outcome of the project.

However, all these contributions were used to fine-tune the final wording of the Priority Topic description 3, as follows:

Validated Priority Topic description 3 – Area: Interoperability by Design

To ensure accessibility, sharing and protection of data from different sources, such as IoT wearables and sensors through the development of international standards, and procedures and incentives for producers accessible for all countries based on an interoperability-by-design approach of digital solutions for preventive and integrated care, independent and inclusive living of the older persons.

3.2.1.3.1 Priority Topic Description 3 [Area: Interoperability by Design] | References

IDIH Experts were also asked to list any recent publication or relevant study supporting the validity of such topic as a Priority at the regional/international levels (EU/China/Canada/Japan/South Korea/USA). Below are the references provided:

- [Telehealth and the COVID-19 Pandemic: International Perspectives and a Health Systems Framework for Telehealth Implementation to Support Critical Response](#), doi: 10.1055/s-0041-1726484. Epub 2021 Apr 21.
- [4 Trends in Senior Care Critical for the Future of Interoperability](#). By Jeremy Delinsky, Chief Operating Officer of Devoted Health 09/28/2021.
- [Evaluation, Acceptance, and Qualification of Digital Measures: From Proof of Concept to Endpoint](#). By Jennifer C Goldsack, Ariel V Dowling, David Samuelson, Bray Patrick-Lake, Ileana Clay.
- [New HL7® FHIR® Accelerator Project Aims to Improve Interoperability of Social Determinants of Health Data](#). ANN ARBOR, Mich. and LEAWOOD, Kan.
- ['openEHR'](#) is the name of a technology for e-health, consisting of open specifications, clinical models and software that can be used to create standards, and build information and interoperability solutions for healthcare.
- [UbiComp](#) is a premier interdisciplinary venue in which leading international researchers, designers, developers, and practitioners in the field present and discuss novel results in all aspects of ubiquitous and pervasive computing. This includes the design, development, and deployment of ubiquitous and pervasive computing technologies and the understanding of human experiences and social impacts that these technologies facilitate. Latest UbiComp Conference (2021) was collocated with the 2021 ACM International Symposium on Wearable Computers (ISWC'21). In 2013, the WoT 2013 Fourth International Workshop on the Web of Things of UbiComp, this could be relevant: [Toward Interoperability in a Web of Things](#)

3.2.2 Phase Two: Envisage Impacts, Barriers and Opportunities

According with the methodology described in [section 2.1](#) (see *Vision*), to further refine the *Roadmap: towards the enhancement of International Cooperation for Digital Health for AHA*, IDIH Experts were lastly asked to complement the validation of the three Priority Topics descriptions (*phase one* of the follow-up of the online event of 19 November 2021) with the information needed to:

- Outline the expected impacts of an enhanced international cooperation scenario based on the three validated Priority Topics,
- Identify and classify barriers and opportunities that prevent or favour the implementation of the three validated Priority Topics.

By 11 January 2022, **seven Experts had participated** in phase two of this follow-up survey, as part of the 3rd EG Workshop:

Table 3: List of participants of 3rd EG workshop's follow-up survey phase two

Name and Surname	IDIH Expert Group	Country/Region
Emily Lee	Integrated Care	South Korea
George Demiris	Independent and Connected Living	USA
Kendall Ho	Integrated Care	Canada
Marie-Pierre Gagnon	Independent and Connected Living	Canada
Matteo Melideo	Independent and Connected Living	Europe
Ville Salaspuro	Integrated Care	Europe
Yanchun Zhang	Integrated Care	China

To envisage the possible impacts of the validated Priority Topics, Experts were encouraged to focus on the **target groups** most affected by the Priority Topics' eventual implementation at the national/regional/international level. Therefore, they were asked to map the stakeholders that are more targeted by such priorities and to then frame the related **expected impacts** the three Priority Topics may have on these stakeholders.

Barriers and **opportunities** that may negatively or positively affect the implementation and impact of such priorities were, therefore, considered and identified as external factors and independent variables, featuring national/regional/international systems.

Here below are reported the main findings per each validated Priority Topic.

3.2.2.1 Priority Topic 1 (Area: Data Governance)

Validated Priority Topic Description 1 – Area: Data Governance

To foster a shared understanding of the determinants of healthy ageing through new/existing multi-modal and forward/backward longitudinal studies and Big Data analytics based on the use of multiple data sources (such as patient reported data, patient validated data in EHRs, biometrics and biological data), validated with and by patients through personalised-medicine approaches and according to a shared international validation framework which also addresses cybersecurity aspects.

Target Groups⁴

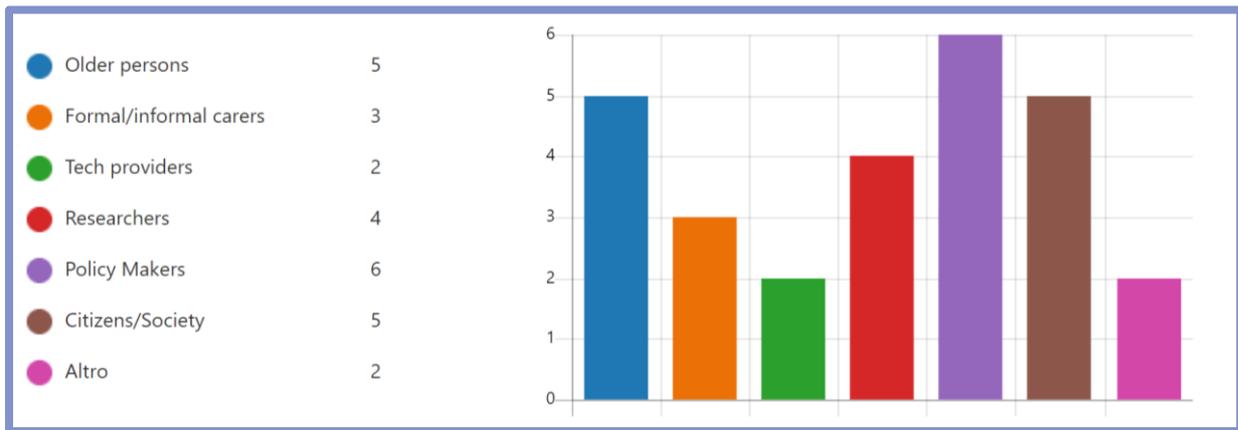


Figure 21: Result of follow-up survey | Target groups of Priority Topic 1

Table 4: Result of follow-up survey | Expected impacts of Priority Topic 1

Expected Impacts	Short term/ Target group	Medium term/ Target group	Long term/ Target group
1. Smoother and faster implementation by tech providers of more sophisticated digital solutions and services that meet the future demand of data handling and allow a timely intervention on older persons and/or their care givers.	Tech Providers	Older persons and Care Givers	
2. Improved self-management and quality of life of the older persons through enhanced quality of more personalized, accessible, and participated ⁵ health care services.			Older persons and Care Givers
3. Reduced workload and burnout risk for formal and informal carers.			Care Givers
4. Improved communication between patients and caregivers.	Older persons and Care Givers		

⁴ Here are listed and ordered the Target Groups indicated as the most affected by the Priority Topic.

⁵ Here “participation” is considered as engagement of end users in decision making around health care services.

5. <i>Improved planning and evaluation of health care services based on the optimization of available data better informing decision making.</i>		Policy Makers	All
6. <i>Reduced economic burden of health care systems.</i>			All
7. <i>Older persons and all citizens getting more familiar with sharing personal health data and allow services integration</i>		Older Persons, Citizens and the Society as a whole	
8. <i>Improved research outcomes based on more accessible and accurate data</i>		Researchers and Tech providers	
9. <i>Enabled data driven and interoperable solutions for different fields and applications.</i>			Tech providers
10. <i>Societal recognition of the importance of health determinants throughout the life course.</i>			Citizens and the Society as a whole
11. <i>Improved security of health information systems.</i>			Citizens and the Society as a whole

Barriers

1. *Lack of Digital Health literacy. [Level of likelihood: low]*
2. *Conservative tendencies of health care industry where verification and application processes are tight and strict, making political, economic and social change slower. [Level of likelihood: low]*
3. *Lack of organizational resources of Health Systems to meaningfully engage/empower patients in the process and address change management challenges. [Level of likelihood: medium]*
4. *Lack of a harmonized regulatory framework for data integration and interoperability that would facilitate data transfer and exchange, mainly due to a scattered decision making throughout the management levels of public affairs. [Level of likelihood: high]*
5. *Non-availability of health data and EHRs. [Level of likelihood: high]*

Opportunities

1. *EU is a forerunner in data governance.⁶*
2. *Public opinion is the most influence method in policy making and implementation. Advancing in understanding and, therefore, empowering patients about health determinants throughout the life course is fundamental for effective prevention policies.*
3. *Guidelines and examples of good practices from US and EU have a great impact on Korean Health Care Professionals.*
4. *A positive attitude can be considered by the South Korean government for advancements enabling data usage and user engagement in this field.*
5. *Health Care start-ups system is rapidly expanding in South Korea.*

⁶ Recent developments are available [here](#): about the [Draft regulation on European data governance \(Data Governance Act\) - text subject to revision \(link added on 15 December 2021\)](#).

3.2.2.2 Priority Topic 2 (Area: Digital Inclusion)

Validated Priority Topic Description 2 – Area: Digital Inclusion

To favour inclusive healthcare systems through age-friendly technologies that address social isolation and loneliness, based on empowerment models, inclusive co-design and enhanced digital literacy practices, supported by international and multi/transdisciplinary research towards the adoption of the 5-As approach (acceptability, applicability, accessibility, affordability, accuracy).

Target Groups⁷

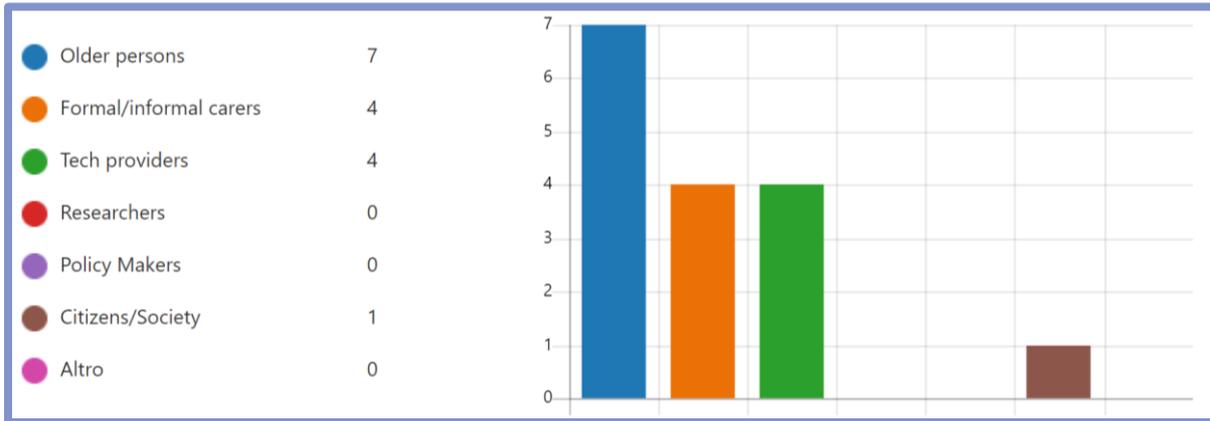


Figure 22: Result of follow-up survey | Target groups of Priority Topic 2

Table 5: Result of follow-up survey | Expected impacts of Priority Topic 2

Expected Impacts	Short term/ Target group	Medium term/ Target group	Long term/ Target group
1. <i>Reduced social isolation and loneliness of older citizens</i>	Researchers	Policy Makers	Older citizens and public
2. <i>Ensure equitable access to public services for older citizens regardless of their background</i>	Researchers	Policy Makers	Older citizens and public
3. <i>Increased digital literacy of older citizens</i>	Researchers	Policy Makers	Older citizens and public
4. <i>Improved healthcare system engagement for older persons</i>		Older Persons	
5. <i>Improved offer of personalized caring services</i>	Tech Provider		Older persons
6. <i>Expanded co-operation and knowledge sharing with EU and partner countries, also for adaptation and replication of successful models and tools.</i>	Researchers, Tech Providers	Policy Maker	Older citizens and public

⁷ Here are listed and ordered the Target Groups indicated as the most affected by the Priority Topic.

7. <i>More inclusive strategies adopted for the engagement of older people in programmes of digital literacy for AHA</i>	Patient groups in urban and rural hospitals and clinics	Groups in local communities	Older persons
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Barriers

1. *Digital technology is still too expensive for some older citizens to purchase. The high costs of digital solutions implementation may be the cause and should be addressed. [Level of likelihood: high].*
2. *Not all citizens have equitable access to digitally enabled infrastructure (e.g., secure broadband, mobile data). [Level of likelihood: medium]*
3. *Some older citizens may be concerned that digital inclusion may disrupt ‘non-digital’ forms of inclusion and social relationships. [Level of likelihood: medium]*
4. *Differences in health care systems and models across countries may represent a level of complexity to be addressed by international and multi/transdisciplinary research. It is necessary to consider national, as well as individual, differences for the verification and standardization of research results⁸. [Level of likelihood: high]*

Opportunities

1. *Digital technology can enable people to stay socially connected despite public health restrictions, migration, and other recent social phenomena.*
2. *Digitalisation of public services is an ongoing transformation. Increasing digital literacy of older citizens will enable them to receive continuous care.*
3. *It is now possible to measure level of Digital Health literacy at all ages.⁹*
4. *Collaborative researchers may establish clinical research networks that can connect older people in different care contexts: e.g., hospitals, clinics, communities and homes.*
5. *We all are getting older, and no one is free from aging. An effective social health care system to manage well without leaving anyone out in the long-lived world is an important and meaningful attempt for All.*

3.2.2.3 Priority Topic 3 (Area: Interoperability by Design)

Validated Priority Topic description 3 – Area: Interoperability by Design

To ensure accessibility, sharing and protection of data from different sources, such as IoT wearables and sensors through the development of international standards, and procedures and incentives for producers accessible for all countries based on an interoperability-by-design approach of digital solutions for preventive and integrated care, independent and inclusive living of the older persons.

⁸ For example, in Korea, most medical services are available to all citizens due to the implementation of the national health insurance system. However, if it is not covered by national insurance, public accessibility is low, so other solutions are needed.

⁹ R. van der Vaart, C. Drossaert (2017). Development of the Digital Health Literacy Instrument: Measuring a Broad Spectrum of Health 1.0 and Health 2.0 Skills. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5358017/>

Target Groups¹⁰



Figure 23: Result of follow-up survey | Target groups of Priority Topic 3

Table 6: Result of follow-up survey | Expected impacts of Priority Topic 3

Expected Impacts	Short term/ Target group	Medium term/ Target group	Long term/ Target group
1. Facilitated access to tools with proven and validated program design from other countries and enhanced collaboration on data sets.		Tech/Researcher	
2. Enhanced evidence-based policy making through knowledge exchange at international level, towards standardization of key findings and common approaches in the field.			Policy maker/Social Level
3. Increased target groups participation through international cooperation for better research outcomes and a meaningful impact on societies.	Tech/Researchers	Older Persons	Citizens and the Society as a whole
4. Better outcomes in interoperability (at international level and among devices) will positively affect Integrated Care at country level.	Tech providers	Hospitals (care givers)	Citizens and the Society as a whole

¹⁰ Here are listed and ordered the Target Groups indicated as the most affected by the Priority Topic.

Barriers

1. *Differences in data security policies and regulations remain an issue for international Research and Innovation. It is important to include a preliminary study phase on this field and consider to favour a policy dialogue at international level, supporting and accompanying the R&I actions proposed. [Level of likelihood: high]*
2. *If data interoperability and some international standards already exist, huge implementation challenges are still affecting research outcomes and this is often due to the lack of interoperable health data made available by the health care services according with specific government policies.¹¹ [Level of likelihood: medium]*

Opportunities

1. *Looking at GDPR as a reference regulatory framework for data security at international level.*
2. *In addition to the healthcare system, the amount of data generated by everyone is increasing, so it is possible to increase the usability for this data linkage and health management.*
3. *Create an interoperability-by-design approach within the AHA/digital domain may generate opportunities in other fields where data interoperability is also needed.*
4. *Global challenges call for innovative ways to embed research in health delivery to identify solutions for implementing interoperability. An opportunity to address this aspect is represented by the [LHS approach](#) – using the new concept of learning health systems to transform the health delivery process globally. LHS vision is relatively new and thus there are plenty of research opportunities.*

¹¹ *US government has spent huge amount of money in these efforts. It remains to be seen whether other countries have the willing to do the same.*

4 Conclusions and Next Steps

IDIH’s objective is to foster collaboration in the field of Digital Health for Active and Healthy Ageing (AHA) between the European Union and five Strategic Partner Countries (USA, Canada, China, Japan, and South Korea). To do so, IDIH focuses on four key areas that encompass common priorities for all countries/regions involved: *Preventive Care, Integrated Care, Independent and Connected Living, and Inclusive Living*. By establishing a “Digital Health Transformation Forum”, the project incorporates society, technology, and industry with policy frameworks to support the development of joint activities in the digital transformation of health and care for older people.

The “Digital Health Transformation Forum” is expected to become a long-lasting mechanism for international dialogue in Digital Health for active and healthy ageing. Since 2019, the Forum has gathered research, technology, and innovation stakeholders in four Expert Groups (EGs): the *Preventive Care EG, Integrated Care EG, Independent and Connected Living EG and Inclusive Living EG*.

With the 3rd EG Workshop and its follow up (November 2021 – January 2022) held completely online due to the persisting COVID-19 pandemic, the results obtained by the respective EGs so far were then shared amongst all IDIH Experts to be consolidated towards a common vision of *how to enhance international cooperation in the field of Digital Health for Active and Healthy Ageing (AHA)*.

Starting from the eighteen priorities resulted from the 2nd EG Workshop, and considering the recent relevant policy orientations at European and international level (see [2.2.1.1 Key Policy Drivers](#)), **three Priority Topics descriptions** were, then developed around the three main areas of intervention – the Priority Topics: *Data Governance, Digital Inclusion and Interoperability by Design*:

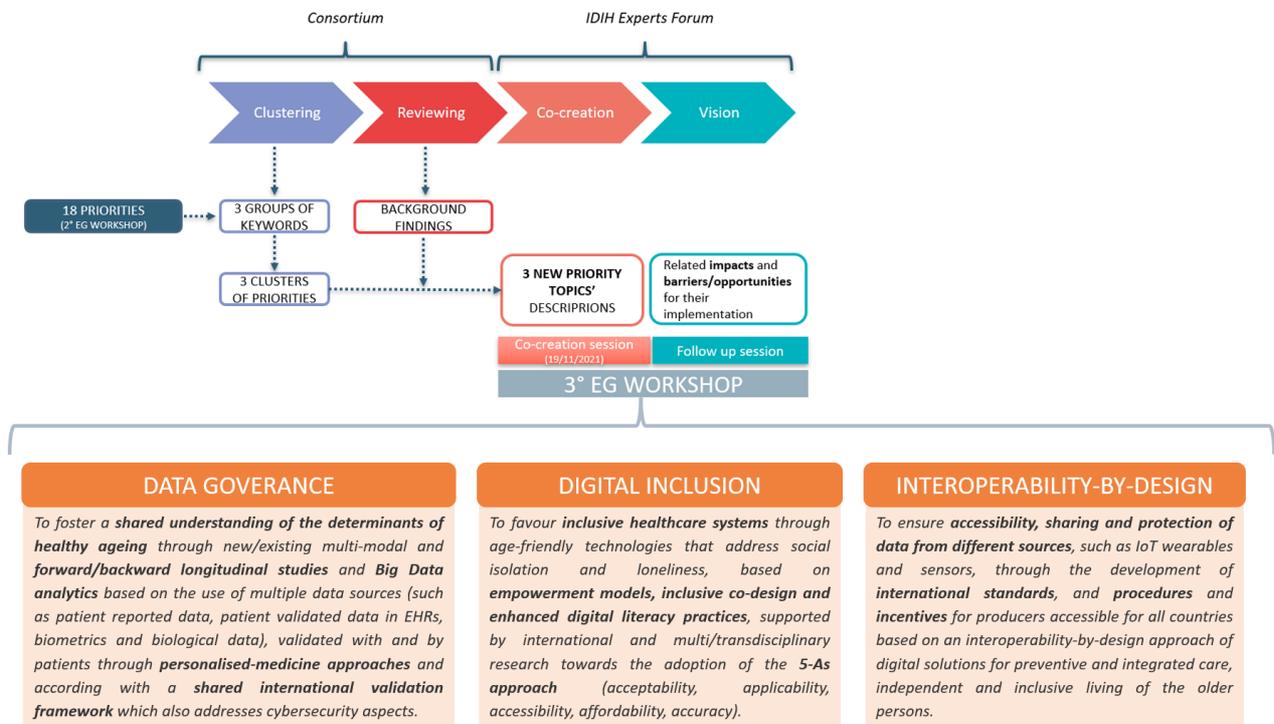


Figure 24: Key results of the 3rd EG Workshop

These Priority Topics were further analysed in the light of *political, economic, social, technological, environmental, and legal implications* that may impact their implementation at the

national/regional/international levels. In particular, the IDIH Experts have provided an approach for their implementation, highlighting envisaged **impacts, barriers and opportunities for each Priority Topic**.

Mutual learning and knowledge exchange between countries and regions addressed by the project was ensured throughout the works of the EGs and, especially, through this 3rd Workshop. However, synergies and promising avenues as well as open issues for all countries and regions addressed by IDIH were discussed and need to be further exploited as part of the project activities.

In this sense, the results of the 3rd EG Workshop will contribute to the further elaboration of a **Roadmap** for policy makers with concrete steps and recommendations to enhance international cooperation in the field of Digital Health for Active and Healthy Ageing.

As next steps in engaging the IDIH Experts in the near future, IDIH will support a fruitful exchange with the users' associations gathered in the project's Users Consultation Group (UCG), where the UCG will be asked to further refine the results of the 3rd EG Workshop and the first iteration of the upcoming Roadmap. Moreover, the policy makers will also be consulted at the next PLC meeting¹² foreseen by March 2022, to align the final works of the Experts with the programming efforts and orientations of funding agencies in the IDIH Strategic Partner Countries.

To be meant as a key and final outcome of the IDIH project, this *Roadmap* (deliverable D3.7), foreseen by April 2022, will also be advanced by deepening (through remote collaboration) the series of publications and recent initiatives, gathered by the Experts and undertaken at the international level and in the IDIH Strategic Countries, to create a comprehensive overview of the trends and enablers of Research and Innovation through international cooperation, towards a future of happy and healthy ageing for all.



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¹² PLC stands for *Programme Level Cooperation*. The first IDIH PLC meeting was held on 27 March 2021. The meeting report is available [here](#).