



# IDIH

INTERNATIONAL COLLABORATION  
DIGITAL TRANSFORMATION  
HEALTHY AGEING

## D3.3

# 1<sup>st</sup> Expert Group Workshop Report

STEINBEIS 2i GMBH



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<b>Abstract</b>
<p>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.</p> <p>The current report summarises first meetings of the expert groups Preventive, Integrated, Independent and Inclusive care groups.</p> <p>The meetings of the respective groups took place between May and June 2020 with the objective to defining an action plan for the future roadmap “Towards an international collaboration in digital health, version 1.0”.</p> <p>The outcomes of the meetings of the first expert group workshops are part of a series of activities during the life span of the IDIH project and as such the report is a draft catalogue of observations and list of preliminary recommended themes to be explored in the subsequent meetings and validated by the user groups and healthcare stakeholders, notably funding agencies and health authorities</p>

<b>Keywords</b>
Preventive, integrated, independent and inclusive Care; Wearables; IoT, Interoperability; data protection; health ethics; infrastructures; international collaboration; digital health; roadmap; well being

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## Abbreviations and Acronyms

Abbreviation, Acronym	Description
APRE	Agenzia per la Promozione della Ricerca Europea (project partner)
ATC	Athens Technology Center S.A. (project partner)
CIHR	Canadian Institutes of Health Research (project partner)
GSBC	Global SMEs Business Council (project partner)
EG	Expert Group
Health 2.0 LLC	Catalyst @ Health 2.0 LLC (project partner)
inno	inno TSD (project partner)
IoT	Internet of Things
MedPeer Inc.	MedPeer Inc. (project partner)
R&D	Research and development
Sawarabi	Sawarabi Group (partner since October 2020)
SPS	School of Pharmaceutical Science Tsinghua University (project partner)
S2i	Steinbeis 2i GmbH (project coordinator)

## Executive Summary

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 main discussion points and findings of the first expert group meeting of the respective groups i.e. preventive, integrated, independent and inclusive care.

The meetings of the respective groups took place between May and June 2020 with the objective to create a common understanding of the vision and first validations of WP 1 (Preparatory work: Analysis of the international collaboration landscape) findings. The first meeting also set the basis for the definition of future actions (in the format of an action plan) for each group and for joint actions of all groups. These actions are following the overall aim to create a "Roadmap to design international collaboration of the digital transformation in AHA". The action plans will have a common structure but will have different steps toward this overall roadmap. The expert groups shall suggest topics of collaboration for a future roadmap "Towards an international collaboration in digital health, version 1.0", which is part of a Deliverable report submitted by end of October 2020. It will be published on the IDIH website.

While there are topics pertinent to the respective group, major themes of common interest have been discussed by the groups. These include consideration to standard tools and secure infrastructures interoperable beyond the regional and the local positioning of both healthcare provider and healthcare customer. This expert group meeting initiates sustainable framework conditions in both technical and legal terms covering ethics, social aspects and funding, reimbursement of novel technologies and tools. This will be based on evidenced impact assessment that in its turn backs up future investments that open favourable pathways for adaptation and upscaling in further meetings.

# 1. Introduction

The aim of the IDIH project is to promote and increase international cooperation to advance digital health in the EU and key strategic countries to support active and healthy ageing areas of mutual benefit. The actions aim to create a “Roadmap to design international collaboration of the digital transformation in AHA”, in which IDIH acts as a vehicle for the international dialogue in digital health. On the basis of identified key opportunities and shared priorities for global cooperation in digital health, the IDIH project has set up a **Digital Health for AHA Transformation Forum** as umbrella and long-lasting expert-driven mechanism to foster collaboration between the EU and five strategic third countries, i.e. the USA, Canada, China, Japan and South Korea.

In this frame, IDIH plans to organise several expert consultation rounds (three physical and remote where and when seen relevant). The aim of 1st expert group meetings of the respective four expert group (EG) are:

Developing a common ground for future discussions, such as:

- Defining an action plan, to be developed by each EG independently. Each action plan (EG focused) – and scheduled activities – will aim to advance on the suggested topics of collaboration of the draft roadmap (“Towards an international collaboration in digital health, version 1.0”).
- Elaborating on strategies to enhance collaboration of RTI stakeholders. Examples of activities to be included in each action plan could be (but are not limited to):
  - Innovation & Policy observatory for Digital Health: establishing a “soft” monitoring mechanism to record any recent advancements and trends on innovation and policy aspects related to Digital Health topics/areas of interest;
  - Foresight Exercises: implement foresight to define or predict where specific Digital Health areas will be 10 years from now;
  - Networking and Community building activities: i.e. organisation of web-seminars, workshops etc.

The first EG workshop was organised with the aim to set the basis and foundations for each EG and support knowledge exchange and mutual learning on the topics of interest.

Topics for discussion included:

- presentations on the current status in the domains of the EG groups and relevant application domains
- policy gaps in the thematic group domains,
- future perspectives,
- needs for future development;
- research and innovation challenges.

The initial plan to do one joint physical meeting with parallel workshops was not possible due to the Covid-19 pandemic. Therefore, all four EG groups were organised in a dedicated virtual workshop in separate dates, according to the availability of the participants. The agenda of each meeting and the list of experts are enclosed to this report in the Annex.

## 2. IDIH Expert Groups - Rational

While there is very little doubt about the need for international collaboration, the question becomes “where do we start?” We think it starts with re-placing people at the centre of health services and promoting their engagement in co-producing their own health.

IDIH presents a plan to achieve this goal with a specific focus on senior adults through an expert-driven approach. Then, four expert groups composed of stakeholders from the EU and the five international countries have been selected to specifically work on the following core aspects that regroup the priorities of the EU and the international strategic countries Canada, China, Japan, South Korea and USA:

Figure 1: IDIH Strategic Topics



Digital technologies can be deployed as solutions in various research and innovation areas and can substantially support health care worldwide. Notwithstanding the fact that the EU and the international strategic partner countries face common healthcare challenges, notably ever-ageing societies, each country/region brings its territories’ economic, cultural and societal aspects into play and has developed strategies and techniques to tackle the challenge of their ageing society differently. Still, there is a clear potential for mutual learning on the deployment of digital solutions to foster healthy and active ageing. In addition, numerous initiatives have been set up that work on this field. These different aspects are of great value and can clearly foster active and healthy ageing on global level, when being exchanged in an open process. Positive impact is expected for society, above all the people who need them most, but it can clearly be expected that research and development (R&D) collaboration and market opportunities for industry players will arise from an open policy dialogue in the field. But only when common priorities are defined and an exchange platform for Research, Innovation and Policy experts is established, a roadmap for international cooperation can be developed and deployed in a sustainable way for the benefit of all.

### 3. Methodology

The four thematic areas (preventive, integrated, independent and inclusive care) have been selected based on preliminary search and consultations. The underlying premises have been validated in line with the policy priorities identified through desk research and taking on stock the interviews with professionals and industry representatives in EU and strategic international partner countries. To ensure a holistic view, experts were recruited from several stakeholder groups: research/academia, industry (digital health, healthcare investments, pharma), government agencies, and clinical practices. Interviewees were selected based on their experience with digital health, aging populations, and knowledge of regional and/or global healthcare trends.

The aim of the expert groups is following the vision to design a sustainable international Digital Health Transformation Forum.

The forum shall act as a network platform with the following aims:

- to identify opportunities and shared priorities of mutual benefit,
- to promote and increase international collaboration,
- to advance digital health in the EU and key Strategic Partner Countries,
- to support active and healthy ageing (AHA) through innovation.

The detailed objective in the preparatory work (WP1) was, at a first stage, to identify trends, priorities and a panorama of digital health research and innovation. The results have been published in 3 reports:

- Report on Trends, Drivers and Enablers of Digital Health;
- Panorama of the Digital Health Landscape in EU and in the Strategic Partner Countries;
- Recommended areas to Consider for international cooperation in Digital Health Research & Innovation.

At a second stage, these results are in the process to being validated by the expert groups in the respective thematic areas. For the selection criteria and modus operandi, see Del. 3.1. and 3.2. Prior to the meeting with the experts, all the above-mentioned reports have been made available to the experts in order to have a common discussion basis, on the one hand. On the other, the reflections, comments and resulting discussions shall be channelled at a later phase of the project into the IDIH roadmap. The facilitators will compile the results of the meetings and dispatch to their respective group the minutes. In parallel, all results of the different groups will be compiled and prepared to be disseminated to the policy and user group for further consultations (WP2). The feedback loop will be reiterated in the second and third expert group rounds and the related validation processes. Therefore, it is worth mentioning that the findings of D.3.3. are preliminary and as such, this report is a living document that will be updated with the newest findings after each expert group round and the subsequent validation iterations described above.

So, the current report is reflecting the 1<sup>st</sup> expert group meetings that took place virtually between May and June 2020.

Although, the four expert group meetings are operated independently from each other, they follow the same format. They are jointly directed by IDIH partners, supported by an expert chair. For each group the structure of the first meeting was worked out and how to tackle the overall questions for this first



meeting. Accordingly, in addition to the presentation of the scope of the respective working group, the following issues have been staged and discussed:

- Presentation of panorama of trends and drivers pertaining to Integrated Care in Europe and the strategic partner countries
  - Current trends and drivers,
  - Research and Innovation efforts,
  - Legal and regulatory framework conditions.
- In-depth discussions on specific areas of the respective working group focusing on new, innovative technologies for individuals, professionals and organizations.
- Outline of potential opportunities for collaboration between the EU, US, Canada, China, Japan, and South Korea by demonstrating the most competitive strengths of each side and respective good practices.

To have a lively discussion and start gathering information, questions have been asked during the online meeting. The following questions were then left open for a more in-depth contribution as a follow up:

- General question on the scope of the respective sector group and if it needs further focus,
- Priorities of the experts for future development,
- Challenges and options suitable for international cooperation: main topics/priorities, priorities on suitable countries for cooperation,
- Requirements in the specific countries e.g. on expert group systems, tools or procedures to help to overcome barriers for collaboration,
- Covid-19 and its impact on the respective expert group.

Each group is coordinated by an IDIH expert facilitator who took over responsibility for the moderation and presentation of the framework and acts as rapporteur of the group.

- Preventive care: Martina De Sole, Mathilde de Bonis, APRE
- Integrated care: Hicham Abghay, Charlotte Schlicke, S2i
- Independent care: Matthew Holt, Catalyst @Health 2.0
- Inclusive care: Vassilis Papanikolaou, George Zissis, ATC

In order to cater for a homogeneous report and to be able to carry out a solid comparative analysis at a later stage by end of the project, the respective expert group facilitators and the corresponding chairs follow a uniform structure based upon a general agreement on the above-described methodology and in line with the terms of references as described in D3.1.

The Digital Transformation Health Forum is in a sense clocked around three expert group meetings but meant to progress in a continuum. The IDIH facilitators will cater for an intermittent communication not only within the respective groups but also between the 4 expert groups. Originally, the EG meetings were planned as physical workshops with parallel sessions and a common meeting in a plenary session with the “rapporteurs” and the chairs presenting their findings and conclusions. Due to the current situation, a physical convention has been replaced by virtual meetings with all experts. In order to avoid one-way communication and silos within the groups, the IDIH findings and review of the IDIH reports will be shared with all EGs and presented during the virtual meetings dedicated to the whole groups to

further discuss the current state of play, future needs, available research/research gaps, policy gaps, and areas of opportunity.

For that purpose, the IDIH partners acting as facilitators will determine the best communication practices among expert group members and establish an active communication platform, this includes the communication strategy such as the definition of further virtual meetings and calls and to create an accessible and realistic working environment for experts.

To enable a team spirit and networking among the group, a template has been prepared and provided to the EG members to enter on 3 ppt slides a short CV including key areas, experience, key words related to experts' work and link to good practice the experts would like to share. Accordingly, besides offering the opportunity for the experts to increase their networks and visibility, IDIH facilitators will identify suitable topics for possible webinars and target audiences for each to share this knowledge and good practices beyond the realm of the respective expert group. This will increase the added value of the Digital Transformation Forum by also exploiting the pool of data in the previous work including relevant contacts, organizations, external stakeholders, networks and initiatives who could benefit from the resources and offer which the IDIH project can provide. The future experts group meetings will continue on these elements described above as well as with further actions (following their action plans). The main actions are also summaries in chapter 5 of this report.

On a regular basis, IDIH facilitators will create an outline for the key topics and share relevant information, articles, links regarding each topic among EG. They will also warrant a continuation of the initiated discussion on needs and bottlenecks of developments per User Groups and application areas, as well as challenges and opportunities for international collaboration. Therefore, the feedback and reports stemming from Work Package 2 with input from the user groups and funding authorities is of utmost relevance. Based on that input, among others, IDIH partners will create and maintain a list of greatest opportunities for collaborations among the EU and the strategic partner countries and curate a pool of applicable funding schemes and potential opportunities to encourage and support this process.

## 4. Scope and findings of the 1st round of Expert Meetings

The following section elaborates at the level of each expert group on its major focus. It begins with a short description of the scope of its work. The key messages elicited are around:

- Current status in the domains
- Relevant application domains;
- Policy gaps in the thematic group domains
- Future perspectives, needs for future development;
- Research and innovation challenges.

The report concludes with the outcomes of the first discussion round and the way ahead.

### 4.1 Expert Group I - Preventive Care

#### 4.1.1 Scope of the Expert Group I Preventive Care

The focus of the group will concentrate on prevention, early diagnosis and detection. AHA (Active and Healthy Ageing) begins with a prolonged health regimen. Tech-enabled solutions that engage users in health and wellness techniques will allow active and meaningful senior lifestyles.

The focus of IDIH within this field will be on innovative technological themes and applications on early diagnosis and detection such as health information technology, mHealth, portable and wearable devices, eHealth, telehealth/connected health, gamification, big data analytics, personal genomics, health and wellness apps, interoperability, social media. It considers also aspects related to life-style, dietary habits, a path towards well-being and mental health as crucial preventive care actions.

The first on-line meeting took place on the 18<sup>th</sup> of May 2020. After a presentation of the project and of the expert group objectives and expectations made by the facilitator the four participants introduced themselves and their expertise in preventive care.

The expert group is displayed on the IDIH website (<https://idih-global.eu/expert-groups/expert-group-preventive-care/>)

#### 4.1.2 Expert assessment and findings on Preventive Care domain

The key messages of the group are:

- Preventive care measures shall take into consideration age related and tailored parameters
- Preventive care should include care to help both physical and mental health wellbeing
- Place sensitive measures shall be put into place to consider rural vs urban lifestyles and environments



**Figure 2: Preventive Care Strategic Topics**

- International accepted standards and parameters are of importance especially when considering comparative analysis of data
- Data protection is a hurdle to preventive care as access is an issue related to trust and acceptability

#### 4.1.2.1 Positioning and status of in Preventive Care domain

The discussion verged on the status of Preventing care in the country of origin of the experts and the importance of International cooperation and a global approach. To answer the main topic of discussion, we have asked the Experts to fill in a Google doc to cover the most important topics.

It has been highlighted that there are two main levels of preventive medicine: primary and secondary. The primary level specifically deals with disease prevention versus secondary that deals with early detection of disease. Both must be deployed simultaneously to be overall cost-effective. For example, there should be a dual focus on smoking cessation and early detection of lung cancer. Early detection of lung cancer can reduce the cost of treatment by as much as 90% and increase survivability by 10X. An ounce of primary and secondary prevention is worth a pound of cure.

It is also important to apply the closed-loop scheme: from data sensing, modelling, prediction, to feedback. According to one expert of the group:

Most doctors practice in a vacuum because there are very few closed loops in medicine. For example, a doctor makes a presumptive diagnosis and prescribes a medication. Most times, he or she doesn't know if the prescription was filled, taken properly, taken in entirety, and effectively. Many patients do not report back if they visit another doctor for the same ailment or get better without the medication. If the condition is relatively benign, the patient gets better anyways, and the doctor presumes treatment was correct and effective. If the person changes doctor or even dies, the first doctor often remains uninformed what role he or she played. Quality healthcare requires tracking of diagnoses, treatments, and outcomes in a manner that reinforces good practice and eliminates bad practice.

Preventive care can monitor personal health condition from different aspects (such as behaviour, bio-parameters, mood) in a convenient way, which can be the evidence to analyse the abnormal situation of the user in the first place.

In order to gain a better global status, it has been concluded that preventive care should establish big data platforms to integrate information worldwide to find out the macro-level related to abnormality and provide reasonable feedback to users.

#### 4.1.2.2 Relevant applications and technologies in the Preventive Care domain

When talking about longevity and relevant applications and technologies, personal genomics related to AHA seems a little bit narrow and should include a wider view on AHA. The experts highlighted that we need to give answer to general questions to advance this topic, such as which are the main reasons why people live longer than others? Is there a correlation to genetics, to life rhythms, to types of food, to

climate, or to whatever else? Which are the “weights” of each reasons? Do other regions exist similar to the already recognized Blue zones?<sup>1</sup> Which are the geographic areas opposite to the Blue ones with the shortest lifespan, and what are the reasons why it occurs?

A further aspect worth considering relates to correlations between the health status of the population and surrounding conditions (e.g. pollution, climate, habits). We need answers also to some specific questions:

- are “Blue Zones” characterised by low-levels of pollution, mild climate, slow-life rhythms, etc.? In other words, is it possible to relate longer-life than average with “surrounding conditions” with respect to born-genetic ones?
- To what kind of “pollution” can we refer? Chemical substances in the air, electro-smog, water contaminants, and/or what else?
- How do climate conditions interfere with (un)healthy status? Does it depend on temperature and/or humidity and/or saltiness, etc.?
- Are busy or quite life a common denominator of bad- or well-being?

Preventive care should include applications and digital health solutions that can contribute to help both physical and mental health wellbeing. Preventive care has to sense personal health condition both physically and mentally in a less obtrusive manner and shall give personalised prediction and feedback based on the knowledge and experience from larger user pools.

In light with the Covid-19 insights, preventive care has to prevent diseases in asymptomatic subjects, with tailoring to their age-range, gender and ethnicity.

A further relevant aspect related to preventive care is the need to exchange expertise among nutritionists and among geriatricians. The knowledge of the impacts of food and nutrition on health, and the knowledge of typical diseases and treatment of the elderly are essential for guarantee wellbeing. However, currently these two types of knowledge are essentially split between nutritionists and geriatricians. As such this aspect represents a true bottleneck. Differently, it could be convenient to involve a new type of experts who can sum the main, and more relevant, aspects of both types of knowledge similar to “medical engineers” who “integrate” the main aspects of the medical and the engineering fields, it could be relevant to create a new expert profile, possibly referred to as “geriatric nutritionist”, who can “converge” the main aspects of different types of food and nutrition that are more relevant for assessing positive impacts on ageing.

#### 4.1.2.3 Policy gaps at international level in the thematic group domains

International cooperation would be essential to tackle global issues, that will request global solutions. The experts suggested the following main areas of actions to advance preventive care at international level:

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<sup>1</sup> On 2005, a cover story of the “National Geographic magazine” defined as “Blue Zones” the world regions with a higher than usual number people living longer than average. Currently, five Blue Zones are posited, being in the islands of Okinawa (Japan), Ogliastra, Barbagia of Ollolai, Barbagia of Seulo - Sardinia (Italy), Nicoya (Costa Rica), Icaria (Greece), Loma Linda - California (US).

1. International standards:

Establishing standards for preventive care would be beneficial for the advancement of research. Quantitative measurement of health (mental and physical), using the same metrics and analysing common set of data would facilitate the exchange of knowledge.

2. International common dataset and e-diagnosis toolset

International cooperation is needed to establish electronic diagnosis toolsets for challenging diseases worldwide such as Parkinson and Alzheimer Diseases. In order to establish a fruitful international collaboration, it would be suggested to create a common database. This database must be filled with objective data coming from objective measurements that are only possible with instrumental tools. While sharing information within the same database, it is crucial that the measurement results could be comparable. This would only be possible if different Countries use the same instrumental tools that can become a unique diagnostic toolset for all the partner countries.

3. Standardisation of definition and measurement of pollution for an effective investigation of correlations the health status of the population and surrounding conditions

To find evidence of correlation of the (un)healthy status of the population and the surrounding conditions, especially referring to pollution, it would be necessary to have an evident definition of pollution and well-defined thresholds of pollutants. This would guarantee that each country and its industrial ecosystems would take responsibility for production in-site without the possibility to move their industrial plants in countries that would have different measures. Therefore, there is a need to define internationally accepted parameters of pollution thresholds (e.g. fine powders, electro smog) before studying their relation to human health.

4. Joint effort to fight and defeat widespread mental disabling pathologies

Mental disabling pathologies are more and more increasing with aging. This is a highly serious matter, because seniors must enjoy the last years of their lives in health and in full consciousness.

All efforts to increase life expectation are useless without a peaceful and conscious old age.

Unfortunately, mental disabling pathologies are very complex problems to solve. They necessitate not only the involvement of a large number of experts but also require knowledge that is currently still not available or scattered over different disciplines. Therefore, there is an urgent need to gain more insights in order to contain prevalence of mental disabling pathologies.

Accordingly, it would be advisable to devote special common efforts to fight and defeat widespread mental disabling pathologies (e.g. Parkinson, Alzheimer) as a single country or a single company cannot be successful alone.

5. Promotion of a responsible approach to the use of digital health

Promoting a responsible approach to the use of digital health in order to support and favour well-being should be done at a global level. The concept of responsible use of digital health technologies refers here to the concept of equity, diversity and inclusion. Where Equity is defined as the removal of systemic

barriers and biases enabling all individuals to have an equal opportunity to access and benefit from health program.

Diversity is defined as differences in race, colour, place of origin, religion, immigrant and newcomer status, ethnic origin, ability, sex, sexual orientation, gender identity, gender expression and age.

Inclusion is defined as the practice of ensuring that all individuals are valued and respected for their contributions and are equally supported.

#### 4.1.2.4 Future perspectives, needs for future development

The experts have identified the following topics for further discussion:

- To encourage and support healthy dietary habits;
- To identify age-related that target satisfactory health conditions;
- To identify age-tailored average-risk and high-risk groups and related average-risk and high-risk factors;
- To identify tailored screening tests and preventive practices for evidencing and supporting groups of the previous point;
- To perform cost-effectiveness prevention vs. medical treatment analysis of main symptomatic diseases
- Federated learning: to aggregate information/models from worldwide originations under the condition that no raw data are exposed;
- Standard scale toolset: to develop a common informational scale of typical diseases and generate a standard scale toolset.
- The closed-loop scheme: from data sensing, modelling, prediction, to feedback. Quality healthcare requires tracking of diagnosis, treatments, and outcomes in a manner that reinforces good practice and eliminates bad practice.
- To classify geographical areas with higher longevity and correlate them according to genetics and quality of nutrition;
- To exchange expertise among nutritionists and among geriatricians.
- To promote a responsible approach to the use of digital health in order to support and favour well-being and highlight the importance of having a responsible approach to the use of digital health in support for the well-being of the aging population;
- To identify mental health programs and digital health solutions e.g apps that can be used to monitor health;
- To provide technological support for those with mental health issues, especially to counteract social isolation, where robots and apps have proven to be of help.

#### 4.1.2.5 Research and innovation challenges

Potential barriers:

- The equation between prevention and treatment costs shall be re-evaluated with respect to the return of investment in the prevention of the main pathologies related to age
- Non-capillarity of the diffusion of hospital structures: the cost of the same pathology can vary for a patient in a city compared to one residing in a place that is difficult to reach. Therefore, we need to devote financial efforts to tele-monitoring and tele-diagnosis systems;



- Data security and privacy protection: data cannot be shared between different organizations, as they do not have the necessary guarantee and trust that data is safely used without liability issues. Therefore, there is the need to provide solutions to use information without data being exposed;
- The shortage of specialist doctors and the unequal professional skills vary both in urban and rural areas. Furthermore, some diseases cannot be diagnosed correctly and in time. Therefore, there is a un urgent need to upgrade skills and that contribute to improving diagnosis effectiveness especially in remote regions.



## 4.2 Expert Group II – Integrated Care

### 4.2.1 Scope of the Expert Group II Integrated Care

The 2<sup>nd</sup> expert group Integrate Care deals with the topical issue of how to deploy novel digital health solutions that position citizens, patients and seniors at the centre of health systems. Technology in the integrated care domain is intended to provide support at the point of care, anytime and anywhere. This requires redesigning, coordinating and integrating health and social services with the citizen at the core of health solutions and services. This type of innovation includes data sharing between relevant users, and seamless interoperability of devices, tools and care providers.

**IDIH project focus on** new and innovative technologies for but not exclusively on the following application targets.

- For the **individual**: tools to enable them to manage their own health conditions and/or care and support arrangements, getting information, advice, peer support etc.;
- For **professionals**: information sharing, shared records and assessments;
- For **organisations**: in communicating and engaging with the public they serve, including crowdsourcing etc.

The expert group is displayed on the IDIH website (<https://idih-global.eu/expert-groups/expert-group-integrated-care/>)

### 4.2.2 Expert assessment and findings on the Integrated Care domain

The key messages of the group are:

- Challenge related to data ownership and acceptance of tools by stakeholders with different expectations
- Variety of digital infrastructures and issues related to the social dimension
- Retention and interpretation of data needs interoperable systems, security, answers to ethical issues, infrastructures and the question of cost should be addressed

#### 4.2.2.1 Positioning and status of the Integrated Care domain

Integrated care is a broad field and IDIH should narrow the scope.

The value change for patients, healthcare providers, policy makers is happening during the digital transformation. This should be further elaborated. The same goes true for the ethical context. Furthermore, Social aspects (e.g. transgender, ethical, social) not only horizontal aspects, needs more focus and encouragement in the framework of international collaboration.

Challenges for collaboration in general:

- Finding communities of affinity
- Diverging priorities and differing needs
- Competition of health tech industry
- Conflict of interest, e.g. value equality in the health system



Figure 3: Integrated Care Strategic Topics

#### 4.2.2.2 Relevant applications and technologies in the Integrated Care domain

In order to secure a successful uptake of digital health innovations by pharma and healthcare providers, relevant technologies and applications have to consider the following:

- Clinical services that are most ready for adoption
- Use-cases validation at every level in the value chain
- Health risk assessment

The uptake can be observed from 3 dimensions:

1. Governmental/policy dimension: Public health and payment systems to look where are the current publicly funded health areas, what might be the costliest investments and look for technologies that address them: e.g. chronic diseases, elderly as population that tends to use the system more compared to other groups etc...
2. Clinical dimension: clinical services that are most ready for adoption of technologies in the next 1-5 years that become relevant for the clinical system e.g. robotics, 3D printing, but might be also the clinical areas that are most ready for adoption in e.g. mental health, chronic diseases, healthy aging
3. Customer dimension: catalyse what consumers want, addressed directly to the consumers or agencies that deal with consumers that shall lead to equality in access to high quality care.

Pharma can play a primordial role in integrated care related applications in digital health by the provision of:

- Funding resources for tech-start-ups and bringing solutions to the market
- Funding clinical trials: “no money - no solutions”. Early adopters for first tests are easy to identify and to motivate but when it comes to clinical trials of large cohorts, it is a question of funding and also finding unbiased test centres performing these independent pilots

According to our US American expert, in the USA, there is no public private partnership (PPP) funding as in the EU, the one who pays for innovation is not the candidate who profits from financing and accordingly who sees value in operationalising the health service. This causes barriers to collaboration which are based on differing priorities (e.g. value, analysis on opportunity costs, political priorities) and needs (depending on population etc). The Industry view is a question of industrial competition: what counts is a priori the individual benefit of collaboration.

#### 4.2.2.3 Policy gaps at international level in the Integrated Care domain

In general, political frameworks based on identified research gaps shall encourage research innovation. During the discussion, health services research has been shed light upon at the level of 3 discussion blocks. Hence, the preliminary discussions among the expert group members could be summarised as follows:

a) Personalised data: How to use the data for patients, including personal care, healthcare industry and government?

Several challenges have been identified related to:

- Engagement of the patient from the beginning to hand over and to use data

- Difficulty in interaction and agreement within a multi-stakeholder field
- Correct marketing on the use of solutions to build trust
- Who will pay for novel solutions: the end-user or the health system?
- The Problem of data ownership: different expectations (patient vs doctor vs industry vs government). What is a public good, what needs to stay personalised data, should be clarified.

In Canada, there is a Strategic patient-oriented research. According to our Canadian expert, there is a rich area of patient engagement, empowerment and **co-creation**. Data is co-managed between patient and health professionals and care givers. This leads to developing **usable** technologies.

A further discussion point is that data and technologies are both enablers. In these regards, to be able to combine tools for customised services and integrated care is a challenge.

Thus, the interpretation of data is a further challenging topic that has been raised and correlates to capacity building and digital skills depicted below.

#### b) Building relationships and capacities:

There is a need for education for using digital health solutions. Accordingly, there are different expectations on technology. There is still a need for clarification as to what is in it in big data, AI and deep learning for the doctor and what are the ramifications for them in terms of the interpretation of data.

Furthermore, beyond the need of interoperability, security issues and answers on ethical issues, infrastructure and question of costs are still open.

#### c) Equity and access to high quality care and how it influences the way we look at technologies:

It is generally agreed that research and innovation is costly. Therefore, there is a catalogue of themes that have been addressed summarised into:

- Affordability: who pays for high quality care (reimbursement, off-shelve, social, economic conditions)
- Usability: the degree of digital literacy
- Acceptance and the cultural perceptions of digital health tools
- Trust: reliability and safety (certification) of diagnostic tools
- Availability: Access to technologies and infrastructure: Urban vs Rural schism.

The latter is a significant problem in the US but experts observe it also elsewhere. Good practices and innovations are often very small pilots and in geographical very limited locations. this can distort the general liability of results as well as the autonomous impact of the outcomes. It relates also to the whole **diffusion** question as it is at the core of many of the problems with respect of the rural urban divide. There needs to be a lot of attention considered to that.

Furthermore, in light of the current developments related to the uproars between the police and minorities in the US as well as the pandemic, it has been stated that there shall be more light to be shed into the question of minority research (ethnic, linguistic, religious...) and digital health solutions tailored to them.

#### 4.2.2.4 Future perspectives, needs for future development

With regards to future perspectives, it has been stated that there is a need of more strategic patient-oriented but holistic research that includes exchange of good practices, different dimensions, including patient needs. Novel solutions e.g. AI solutions need to understand the patient.

Future perspectives and influencing factors to be addressed are:

- Human factor role in a difficult to use instrumentation correlated with lacking digital skills
- Workflow and reengineering: integrated concepts aligned to the workflow of the organisation decide about the adoption of digital tools. If health professionals do not look to digital technologies, in the context of a reorganisation of the whole health system to integrate all these digital tools, undertakings limited to re-engineering will fail.
- Technology interface/relationship and its role on social relationships and acceptance of intelligent technology in society. The speed of innovation in some cases is not matching with the acceptance in society. E.g. autonomous response technology in health care is not yet able to catch the whole picture of the people incl. the social context and the challenge to ask the right questions. This is also strongly relating to health risk assessment. In order to generate trust, these solutions shall underly certification and strict standards.
- Ethics: digital health solutions generate large amounts of data that could be exploited for further research but also create challenges related to privacy and ownership. Digital health solutions create new opportunities for data for individual use, but this creates also challenges on privacy and ownership.

According to our European expert in Finland, Care (Self) Assessment tools offer a catalogue of online questions (symptom tickers) provide guidance to the right health service. The system gives responses as the process is digitalised. The tool has higher satisfaction rate; but could be a challenge for older adults due to the **need of personal interaction**.

Precision medicine or personalised medicine has been indicated as a future common field of application and priority. Our South Korean expert for example reports of the creation of biobank e.g. with all the issues linked to personalised data that might equal to similar efforts in EU e.g. Iceland, Scotland or parts of the Baltic sea countries

Finally, it has been discussed that funding of digital health solutions should be incentivised on the basis of impact-oriented outputs. This is an approach that is followed e.g. In EU programmes e.g. H2020 and the following framework program especially the European Innovation Council subprogrammes.

#### 4.2.2.5 Research and innovation challenges

Challenges and opportunities for international cooperation that have been identified are:

- Clinical areas: investment in mental health, chronic diseases, healthy aging, wellbeing;
- Ethics in digital transformation: there is the necessity to clarify ownership and use of data;
- Rural vs urban areas: digital infrastructures and issues related to a social dimension are common understanding. However, there is high need for more research on acceptance to enable decisions, financing and actions as well as infrastructural planning;
- Hospital vs home: evaluation of event-driven approaches compared to continuous availability;

- Patients: research on relationship (human beings and machines/technology) between specific human beings and pieces of technology: it will be useful and evident to have a personalised and tailored health assessment, to understand different level of engagement and acceptance;
- Minority research (such as ethnic, linguistic, religious) needs also to clarify if digital health solutions reach them and if not how to tailor to them. More research shall be conducted on communities than on geographical topographies;
- Focus on communities: it is not only about geographical dimensions, but about identity, there are different attributes to define and consequently address them.

Challenges for individual consumers have been identified related to:

- Solutions have to create value at every level (dimension), otherwise there will be trouble in getting anywhere;
- eSkills and patients' needs are still not given enough due consideration and consequently not addressed as a major bottleneck. It is about putting the patient into the centre and closely looking to what they need (where to start, what service would fit). It is still not elaborated enough, what the patients want and what they really need. So, there should be more research on these aspects!
- Certification and approval: awareness activities shall be increased. There shall be more efforts to be done to find a way to overcome the trust gap in society (speed of innovation), as there is still too much a negative image spread via diverse communication channels. In some cultures, there is a high mistrust against authorities. "Speed of innovation is united to the speed of trust" (e.g. mistrust in several vaccines in trial on Covid-19). So the topic of trust needs to be addressed in future research.
- AI solutions need to understand the patient and not the other way round. To understand the patient in the context where they live. AI does not judge context / value social relation nor the point of time a patient or geographical situation etc... AI is not sensitive enough to send the right questions yet

Among the factors preventing and limiting international collaboration are:

- Political strategies and priorities e.g., linked to most expensive health areas
- Regulations e.g., on connectivity
- Status of digitalisation transfer status and speed; "ecosystem" of countries
- Size of pilot tests: the challenge of replicability in other regions
- Ethical priorities incl. minorities, reflecting personnel rights
- Missing funding/financing
- Financing models for research on e.g., minority research

## 4.3 Expert Group III – Independent and connected living

### 4.3.1 Scope of the Expert Group III Independent and connected living

The Independent and connected living group is focusing on Tele-monitoring via smart home and living technologies

With the burden of innovation on the device and software companies, there is a considerably low barrier of entry to offering quality tech enabled solutions. Many businesses are currently prototyping and developing in this space. These companies are comfortable in sharing application programme interfaces (APIs) with developers, enabling a broader range of options to the consumer that allow a creative collaboration of ideas to ensure that the best products are brought into the market. Connected living is being made possible through smart sensors and buildings, mHealth solutions, mobility aids, secure data, robotics, and eHealth.

IDIH project focus: Technological topics and themes such as IoT, automated emergency call systems, vital signs monitoring systems, reminding systems, automated health assessment and automated activity and fall detection systems will form the basis of all activities to be implemented with the scope of IDIH project.

The expert group is displayed on the IDIH website (<https://idih-global.eu/expert-groups/expert-group-independent-and-connected-living/>)

### 4.3.2 Expert assessment and findings on the Independent and connected living domain

The key messages of the group are:

- Facilitating Independent and Connected Living requires more than just novel technologies. Policies, care delivery models, cultural and social factors, and environment all play a part.
- Health disparities as well as health and digital literacy influence technology adoption among the senior population.
- Key technologies that can promote Independent and Connected Living include:
  - **Smart Home/Environment** technologies such as sensors (bed, 3D, depth sensors), IoT voice activated appliances, smart stairs, and smart home utilities.
  - **Social Connectiveness** technologies such as robots, conversational agents, AR/VR.
  - **Person-based Monitoring** which includes wearables such as smartwatches, wristbands, clothing, shoes/inserts, and glasses.
  - **Data Analytics and AI** serve as the underlying technology behind the tools and products to promote independent and connected living (e.g. chatbots, sensors).
- While research on the feasibility of key technologies is available, more research on its impact on clinical outcomes such as hospitalisation, quality of life (QOL) and cost effectiveness is necessary.



Figure 4: Independent Living Strategic Topics

- Covid-19 has prompted an unprecedented adoption of virtual care delivery - encouraging both the older adult generation and federal agencies to experiment with digital health. This sudden, large-scale adoption is expected to increase evidence-based research about digital health for AHA and ideally, boost senior acceptability of health innovation.

#### 4.3.3 Positioning and status of in Independent and connected living domain

After feedback from the expert group and web-consultation, the current state of play across the EU and strategic partner countries can be summarised as follows:

- **Canada:** The Canadian healthcare system is comprised of 13 provincial publicly funded healthcare systems that take care of 38 million citizens. With the provincial health systems, Canada has a lot opportunity for experiments with different innovations and delivery models.
  - Healthcare spending has been trending upwards and rapidly increasing. For many provinces, healthcare spending accounts for half of their budget.
  - With the current remuneration system, there aren't incentives to improve outcomes, which is an important lever to advance digital health.
  - Covid-19 is likely to change the way care is delivered and how Canada approached health technologies.
  - Nearly 80 % of older Canadians are confident about using technology yet only 20% use technology for health and wellness so there is a need for education and training on the use of digital health.
  - Adoption of technology or innovations are dependent on leadership and policy environment. Provinces like British Columbia have demonstrated strong commitment towards innovation and remuneration for virtual visits.
- **United States:** In the US, telehealth has accelerated drastically due to COVID-19. The Centre for Medicare and Medicaid Services (CMS) expanded the use of telehealth through the 1135 waiver, which allows for communication technologies that were not previously allowed under HIPAA to be used. CMS also expanded reimbursements for remote patient monitoring platforms/services. Telehealth aside, American consumers have become a major driver in adopting new technologies though transferring technology into clinical practice is still lagging. Technology companies are increasingly pivoting their products towards healthcare (e.g. smartwatches with fall detection capability, Amazon Alexa for querying blood glucose readings) but to be reimbursed, a larger evidence-based is needed.
  - "Smart Homes" and using IoT to facilitate passive monitoring have gained a lot of traction. Typically, these initiatives come from research partnerships but there has been a shift towards a research-industry model in recent years.
  - Industry players' involvement in healthcare has brought about commercially available sensor-based systems but remain rather basic (e.g. monitoring time spent inside the home, tracking behaviour).
  - Other technologies like wearables are also widely promoted as a health tool. However, data generated from sensors and wearables are still puzzling researchers and consumers alike—how can data be transferred safely between patients/providers, what is measured and collected, and how do we make sense of the data?

- Innovative technologies addressing Social Isolation and Loneliness have been deemed as a national priority.
  - The National Institutes of Health (NIH) have been increasingly embracing digital health such as AI, conversational and social robots, and voice interface technologies (e.g. Amazon Alexa) and evaluating their impact on health.
- **Japan:** Japan is projected to have 20 million people over 75 after 2025 while the number of people who can work will decrease to 71 million in 2025. In Japan, there is a long-term care insurance system for seniors and patients are categorized into care levels (with care level 5 meaning the patient can no longer walk or do daily activities). The number of patients categorized as care level 5 increased from 2 million in 2000 to 6 million in 2017. To further exacerbate the issue, Japan is facing an extreme shortage of caregivers. Hence, improving care for this population has become a major priority
  - Government has promoted research and development in mobility assistive devices, as well as robotics.
  - Supporting tools like exo-skeletons and walkers have been researched to see if these tools can improve patients' health and reduce stays in hospitals. Automatic wheelchairs were also researched to help seniors maintain a social life and independence.
- **Korea:** In general, the Korean healthcare system is well-equipped in health technologies and has a high adoption of EMRs. The government is utilizing telemedicine but Korean seniors typically do not use it unless there is no other choice (e.g. COVID). In addition, Korean healthcare is still focused on reactive treatment rather than a preventive approach. Moreover, Koreans typically practice medical pluralism and utilizes self-care and self-medication to complement clinical treatment. The Korean government is interested in aiding their senior citizens through:
  - Smart Home Technologies (smart home utilities, smart speakers, and monitoring devices)
  - Global connection via telemedicine
  - Research on the long-term benefits of telehealth, mHealth, and eHealth for the QOL for seniors
- **China:** China has had notable advances in technology but its applications in health are just starting. The most notable advancement is the use of Electronic Medical Records (EMR), now widely implemented in Chinese hospitals. However, the EMRs are siloed. China also has large disparities in technology adoption across the nation. Underdeveloped regions and rural areas typically do not have EHRs. Large cities with ample financial resources are more likely to be able to adopt health technologies.
  - Wearables are commercially advertised but not necessarily for medical and healthcare purposes.
  - AI and Clinical Decision Support Systems (CDSS) are being researched and developed but its implementation varies across regions.
  - The Chinese government has issued various action plans and strategic goals to advance the healthcare information infrastructure. This has led to an increase in R&D regarding AI and health technology products. Such action plans include:
    - “Big Data Action Plan” developed by the State Council of China in 2015
    - “Healthy China 2030” developed in 2016 to outline goals for data sharing, deep mining, and widespread application of healthcare data



- “AI Action Plan” issued by the State Council in 2017
  - “Internet and Healthcare Action Plan” issued by the State Council in 2018
- Europe: With elderly citizens (65+) accounting for nearly 23% of its population, Italy and the EU as a whole is interested in exploring methods to keep them active and healthy. Notably, the EU has invested heavily in the following priorities: 1) Citizens' secure access to and sharing of health data across borders, 2) better data to advance research, disease prevention, and personalised healthcare, and 3) digital tools for citizen empowerment and person-centred care. There have been substantial investments and progress in advancing digital health including but not limited to:
  - EIP-AHA: the largest European initiative to foster innovation in the field of health and active ageing;
  - Prescription delivery optimisation such as e-Prescription, PS, eID;
  - Digital Supply Law (Germany) which allows health care professionals to recognize and prescribe mobile apps and digital therapeutic solutions as treatment.

#### 4.3.3.1 Relevant applications and technologies in the Independent and connected living domain

The Independent and Connected Living EG mapped out eight categories in which digital health technologies can be especially impactful for active and healthy aging (see figure below) whereby “Data Analytics and AI” serves as the underlying technology behind many of the tools and products to promote independent and connected living (e.g. chatbots, sensors).

Figure 5: Key Enabling Technologies



Of the categories listed, the following were selected as priorities as they demonstrated the most potential to impact independent and connected living for older adults.

- **Smart Home/Environment** technologies such as sensors (bed, 3D, depth sensors) that facilitate passive monitoring, IoT voice activated appliances, smart stairs, and smart home utilities.

Experiments with Sensors and IoT: In Japan, research found that different types of sensors have different implications for caregivers. For example, 3D sensors, which can track the movement of a patient, are not enough to help caregivers understand if the patient is safe. In comparison, vital sensors (certified medical devices) report definitive information to caregivers that confirm the status of the patient so they can avoid unnecessary visits. Hence, behavioural sensors that can track a person's activity are helpful for research but not necessarily in the clinical setting.

- **Social Connectiveness** technologies such as chatbots, robots for social connection, conversational agents, AR/VR, navigational services, etc.
- **Person-based Monitoring** which includes wearables such as smartwatches, wristbands, clothing, shoes/inserts, and glasses.

#### 4.3.3.2 Policy gaps at international level in the thematic group domains

**In general terms**, International collaboration is needed to create common standards on data, regulation of technologies, and research. Research on independent and connected living technologies are often focused on feasibility, which does not provide evidence for policymakers and payors to scale the tools. More research on technology's impact on clinical outcomes and its impact on patient satisfaction is necessary to move forward. Policy innovations that bolster the digital health ecosystem (public-private partnerships, workforce training, reimbursement models etc) are equally important as technological innovation.

Evidence that informs policy and reimbursement models are critical in advancing digital health. Other areas of research that should be considered include: UX/UI for senior populations and health disparities (race/ethnicity, income, geographic location) and their impact on clinical outcomes. From a policy infrastructure perspective, experts highlighted the following concerns:

- Standards for Data
  - Ethical standards for the use of data in research and data collection
  - Data ownership
  - Monetisation of Data
  - Data sharing on an international context (common agreement on PHI)
  - Data interoperability
- Regulation of Technologies
  - Common definitions of medical device, medical software
  - Standards for regulations on medical device and life science devices
- Standards on Research
  - Standardised international criteria for journal publication and acceptance of the impact/outcomes on a global level

- Lack of Policies to Empower Seniors
  - Policies that address accessibility for seniors
  - Policies that fosters inclusion of older adults
- Reimbursement/Payment Models
  - Limited funding for technologies for seniors in the home that is not directly connected to care provisions (e.g. govt would fund blood glucose cuff not Smart TV's or emerging technologies)
  - Payment model innovation for how to pay for technologies from a social services lens (e.g. tax breaks, subsidisation)
  - Current reimbursement models still heavily linked to reactive services/treatments (as opposed to wellness)
  - Reimbursements are typically limited to hospitals and not long-term care/nursing homes and home care (especially in China)
    - Varies across nations but payments are still more directly tied to in-patient medical care and insufficient for long-term/ out-patient care
  - Reimbursements for caregiver and home care services

#### 4.3.3.3 Future perspectives, needs for future development

When considering future developments in research related to the identified key technologies, experts noted that among the key technologies, the evidence base on care/disease management technologies such as telehealth and remote patient monitoring are well-established. However, more research is needed for the following:

- New wearables such as sensors in clothing and shoes/inserts
- Social connectiveness technologies (at-scale)
- Technologies to manage food/nutrition
- Smart Home technologies
  - Decision support system for elderly at home

Most research on emerging technologies are focused on feasibility. However, this type of research is not sufficient to translate digital health into practice. For a technology to be adopted, it needs research on the technologies' impact on:

- Clinical outcomes (e.g. hospitalisations, Quality of Life (QOL), cost effectiveness)
- Cognitive impairment, dementia
- Satisfaction/happiness of the patient and family
- Caregiver burden

Canada has implemented successful models that boosts health innovation through an ecosystem approach to bolster the digital health ecosystem:

The partnership between the City of Surrey, Simon Fraser University, private sector developers, and Surrey Memorial Hospital: the four stakeholder groups work together to identify the need/demand (e.g. post stroke care) then leverage the researchers from the university and private sector developers to

produce the tools. The city supports these players through tax-free rentals, which entices developers to come into this environment. This model has been replicated in various cities with success.

AGEWELL Network: Funded by the Ministry of industry, AGEWELL is a network comprised of 250 researchers over 42 universities and 35 start-ups to develop innovative technologies on the aging population. To date, they have engaged over 4,700+ seniors and caregivers. The network has developed technologies ranging from AI to smart wheelchairs to home sensors.

- Example project: “Sensors & Analytics for Monitoring Mobility and Memory Hub,” where they tested various sensors in a lab environment then proceeded to real world environments and integral trials.

“Health System Impact Fellowship:” Canada recognised that the ability to use data generated through innovations and evaluate them appropriately. To combat this, the Health System Impact Fellowship was created to modernize training of healthcare professionals. Clinicians, researchers, scientists are embedded into the healthcare environment (non-academic environments) to develop professional skills necessary for these environments. The Canadian Institute of Health Research (CIHR) would partner with health systems and provide funding to place post-doc fellows into their organization to solve specific challenges identified by the host organization.

#### 4.3.3.4 Research and innovation challenges

When we think about active and healthy aging, the expert group identified the following factors that we should consider:

- Supportive homes and communities
- Autonomy and independence
- Health care and health service delivery
- Cognitive health and dementia
- Mental Health
- Mobility and transportation
- Staying connected (family, peers, care team)
- Financial wellness and employment
- Healthy lifestyle and wellness: For example, food/nutrition is often a topic that is neglected when we think about supporting independence for elderly populations. However, technologies that enable seniors to access and consume proper meals and track their diet is necessary.
- Social and cultural norms: For the elderly in China and Korea, it is important to acknowledge their preference in living at-home and being cared for by family. Hence, long term care facilities and nursing homes are not popular and may not have the incentive to adopt new technologies. In addition, medical pluralism is also a factor that is common among non-Western countries.
- Digital and health literacy: Education and training for seniors and their caregivers on the benefits of health technologies and how to use them is necessary. There is a need for targeted health education to increase the acceptability of new care delivery solutions.
- Health Disparities: Race/ethnicity, socioeconomic status, geographic location affects an individual’s ability to access care and/or use technology (e.g. broadband availability, EMR/HER infrastructure).

## 4.4 Expert Group IV – Inclusive Living

### 4.4.1 Scope of the Expert Group IV Inclusive Living

The focus of the group is on helping the elderly feel more connected socially / healthy living. Healthy environments bolster healthy individuals. In the aging population, a component of healthy living is inclusivity, promoting positive social engagement, and ensuring a rewarding social aspect to age.

IDIH project focus: IDIH project will examine in depth a number of existing technologies and platforms in order to define the requirements for international collaboration on developing innovative platforms and solutions to support elderly people in their everyday life. By combining the functionalities of online service, retrieval and composition with respect to healthcare and wellbeing with those of an online social network, such a platform will provide an integrated online environment for elderly people in particular help to bridge the gap between professional and voluntary peer-to-peer service offerings and communication between family members.

The expert group is displayed on the IDIH website (<https://idih-global.eu/expert-groups/expert-group-inclusive-living/> )

### 4.4.2 Expert assessment and findings on the Inclusive Living domain

The key messages of the group are:

Inclusive Living are the processes and outcomes associated with a person’s involvement in all aspects of personal, familial, community, civic and social life. Inclusive Living is not only about technologies for homes. Senior citizens can be mobile and remote from their homes. Technological systems and solutions that facilitate inclusive living of the elderly both at homes and outside exist, but adaption rates are low. It is very important to engage a dialogue with the senior citizens in order to familiarize them with inclusive living services able to enhance their quality of living. Technological literacy programs for the seniors and technical assistance to elders (for health tech) is a key element for the adaptation of such services into their daily activities. It is considered equally important the International collaboration to resolve technological issues taking into account the diversity of the IDIH strategic regions. Covid-19 pandemic highlighted the importance of Inclusive Living and underlined the need for adaptation of such solutions.

#### 4.4.2.1 Positioning and status of in Inclusive Living domain

In order to continue with the thematic dialogue on Inclusive Living topics it was important to start with the definition of a framework able to provide a common view and understanding in what it was intended to be discussed during this meeting. To this end the following issues were addressed and defined.



Figure 6: Inclusive Living Strategic Topics

### 1. Who can be considered as a senior person?

Age cannot be the only indicator. There are people who are 65 years old and older but they operate and live completely independent. Different groups have different age limits. For example, homeless persons are considered as “senior” from early 50s, due to possible health conditions they might face. Therefore, is not about age but about a person’s abilities.

### 2. Senior Person of Now or of the Future?

It is critical to keep in mind that the current expert group should be working towards “seniors of the future”. Characteristics (such as digital literacy) of a senior person now are not the same with the ones of a senior person in 10-15 years from now. This is a key issue to have in our minds.

### 3. Inclusive Living Definition

- Inclusive Living refers to the technological and built environmental eco-system at various levels of community that engages and empowers older adults to have healthy living and meaningful social and civic engagement.
- Outcomes can be related to three broad domains:
  - 1) Relational - social connections with family, peers, neighbourhood, community, nation, companion species, environment.
  - 2) Material - access to safe and affordable housing, age-friendly/universally accessible public spaces, income/assets, infrastructure to facilitate connectivity and participation in different sociocultural occupations.
  - 3) Subjective - personal sense of feeling included, affective/emotional responses to inclusion/exclusion, wellbeing.
- Outcomes may be linked across many or only a single domain. For example, an older person may use ICT technology that makes them feel (subjective) more connected to family members living in a different area (relational).
- The term inclusive living entails a sense of understanding, compassion, belonging, mutual acceptance, and support and fairness in how a group lives.
- In order to have true inclusive living, we must incorporate and consider smart or inclusive design and community into the “living.” This means it should be compatible, realistic, free of barriers (accommodating and accessible), safe, and comfortable.
- Therefore, as we work to improve inclusive living, we must continue to focus on the needs of this special group and understand that any recommended solution must take fully into account the ethnic, cultural and geographical differences of its members.
- We must focus more on the health and social issues surrounding inclusive living taking into consideration the best and emerging practices and technologies to support a hybrid virtual-real approach to aging, focusing on convenience and accessibility as key indicators of success.
- Four Dimensions of "inclusive living" environment:
  - 1) **Equity sense:** Underserved populations are included, like rural people, poor people, minorities, any populations not receiving standard care, leaving no one behind.
  - 2) **Family sense:** Having family caregivers coordinating health care for older members, feeling warm and love at home.

- 3) **Community sense:** Living in community where each and every senior care about each other, sick under care, poor being fed, lonely with companions.
- 4) **Social sense:** Enjoying seniors-focused social networks online and offline in the second half of life journey.

#### 4.4.2.2 Relevant applications and technologies in the Inclusive Living domain

Current technology services and tools are able to facilitate the Inclusive Living of the Elderly while supporting them into their daily activities and life. Examples of common, successful and widely adopted technologies were discussed and presented as follows.

- **KOMP** – is an ICT product that allows a network of people (e.g. Older person and family) to exchange texts, photos and video chat all displayed on a large screen. The product requires minimal activation from the older person, which may help people with cognitive impairment or less digitally literate still communicate with people outside of their household.
- **Mobile phones** – are currently widely available at different price points. Mobiles have a familiar design that allows people to use basic functions such as make calls or text contacts as well as connect to wider network through apps on smart phones; clear design affordances make it easier for an elderly person to understand how to use it.
- **Virtual assistants** (e.g. Amazon Alexa) – are relatively cheap, adaptable and simple Internet of Things hubs. People can use virtual assistants to connect with contacts and wider network on other platforms or apps. It can be used to participate in leisure and entertainment remotely when immobile with voice recognition.
- **Social robots** – Continuously developing robots are able to facilitate better connection with a person's social network, built environment.

#### 4.4.2.3 Policy gaps at international level in the thematic group domains

In order to allow and ease the adaptation of services and technological solutions for the Inclusive Living domain it is important to undertake concrete policy measures able to accelerate their incorporation into the society and particularly enable access to the elderly. Some of these measures were discussed and presented during the first workshop as follows.

- The participating countries needs to **support the start-ups** created by young entrepreneurs and researchers that are commercializing and launching innovative inclusive leaving products and services and generating jobs contributing thus into Silver Economy.
- The organisation of **training programs** for young researchers and professionals allows to build capacity for research and innovation (e.g., Summer Training Program)
- It is considered of utmost importance and a key element for the scientific and research progress in the inclusive living domain the access facilitation to international testbeds by the countries.
- Also, it is a need to organise and initiate programs supported by relevant agencies that will fund joint research in common interest areas with potential of most benefit for older adults.

#### 4.4.2.4 Future perspectives, needs for future development

The Experts discussed about the construction of pathways that facilitate the exchange of knowledge, advance common research efforts, increase the effectiveness of the dialogue and contributing towards international collaboration in the AHA and particularly in the inclusive living domain.

- The development and the organisation of a research collaboration platform will facilitate the exchange of knowledge and ideas (e.g., learning from dementia-friendly technology in Japan), the common use of resources and support the research and development of state-of-the-art solutions in the inclusive living domain.
- A Partnership platform for academia, industry, businesses, policymakers and community organizations will enable a constant dialogue among all interested in the inclusive living stakeholders.
- It is also very important to achieve a channel for best practices exchange and adaptation through thorough examination and comparison of country-based policy innovation and regulatory guidelines.
- The organisation of a common mechanism for training and exchange of graduate students, post-docs and young researchers among the partner countries will enhance the quality of research and advance the developments in the AHA domain in the participating countries.
- It is also very important to facilitate the basic/social research on “inclusive Living” (ALL IDIH regions/countries) in order to better understand and meet the societal needs, create awareness and accelerate the adaptation of innovative services.
- Especially after the recent surge from Covid-19 the support and sustainability of digital platforms for inclusive living (especially; ALL IDIH regions/countries) is very crucial in order to provide the necessary means to the elderly to continue their lives with the minimum effects from the social isolation.

#### Common Requirements

The requirements for the development of services and technologies that contribute to the inclusive living need to take into consideration the different actors of this process as presented below.

- **Older people:** It is essential for senior adults to actively participate in the research and development process for new services and products. The design of these products should carefully undertake a non-stigmatising approach taking into consideration ethical and gender issues. The developed outcomes and the new products need to offer an enjoyable user experience including post-sales support. As to the products and services that are facilitating inclusive living for the elderly, it is important to offer control, autonomy and choice to their end-users.
- **Families/(Unpaid) Carers:** Apart from the elderly, another important group that needs to actively participate in the research and development process for the inclusive living products and services are the Family Members and the Unpaid Carers. These products are also partially addressed to them; therefore, it is equally needed to offer enjoyable user experience and post-sales services support. These services will allow and facilitate the communication/connection with the elderly and will help to reduce burden on informal/familial caring responsibilities.



- **Health and Care Professionals:** The involvement of Health and Care Professionals it is very important in the research and development process for the delivery of inclusive living products and services. The Inclusive Living products need to be able to provide health related services to the end-users preserving friendliness and usability features. Thus, these products will help to provide health related metrics and analytics and contribute to the immediate cross communication of the involved parties. In addition to that, these products will facilitate the reduction of resources and at the same time will be able to increase the quality of the services provided to the end-users.
- **Organisations:** The organisations that are providing services and products to facilitate inclusive Living for the elderly need to be heavily involved in the research and development process in order to enable the generation of better care outcomes/metrics. It is also very important to provide better services (retail, post-sales support) and increase the organisational efficiency. The increase of the provided services quality will contribute into reducing the fatigue and burnout of employees (care workforce). The organisations are also needed to contribute to the interoperability between different platforms/systems.

#### 4.4.2.5 Research and innovation challenges

An indicative outline of the envisaged by the experts' research and innovation actions that needs to take place in the Inclusive Living domain was presented during the meeting as follows.

- The research for the development of innovative Inclusive living services and platforms for the elderly with specific illnesses/disabilities such as dementia, stroke and limited mobility is a challenge that demands the involvement and the collaboration of specialists with different fields of expertise. Such projects might include the participation of institutions and organisations from all IDIH regions/countries with particular expertise in USA, Canada and EU.
- The design, development and evaluation of social and assistive robots to support inclusive living outcomes (ALL IDIH regions/countries with particular expertise in EU, S Korea and Japan) is also another challenge that demands the participation of highly qualified experts and scientists. The involvement and collaboration of research teams and organisations from all the IDIH countries and particularly Japan, S. Korea and China will boost the effectiveness of such efforts towards the achievement of the targeted objectives.
- In order to solve complex problems with interrelated factors impacting technology adoption in senior adults can be achieved with the **international collaboration and trans-disciplinary approach** bringing together specialists from different sectors and disciplines and countries.
- Another important factor that contributes to the success of complex R&D challenges is the **early user engagement**. The co-design among senior adults, care partners, healthcare leaders, policymakers, advocacy organisations is considered essential for the accomplishment of challenging targets with successful accomplishment.

#### Synopsis of the Inclusive Living Group meeting:

Inclusive Living are processes and outcomes associated with a person 's involvement in all aspects of personal, familial, community, civic and social life. Inclusive Living is a key for seniors but should not only focus to technologies limited in home use but has to take into account that senior members are remote

as they travel or move around. Also, age is not the only indicator determining that a person is senior. Physical and mental abilities are the most critical indicator. From the technological side of things, technologies exist but it is all about user adoption and, equally important, of attracting talent for developing applications and solutions especially for seniors. International collaboration on research and technology is also a high priority while additional funding has to be available for attracting and allowing the research community to collaborate and work together. Covid-19 pandemic highlighted the importance of Inclusive Living and underlined the need for adaptation of such solutions.

## 5. Next steps for future Expert Group meetings

The four groups have overlapping dimensions technology-wise for example Independent and connected living technologies can overlap with technologies under preventive care, integrated care, and inclusive living. Issues related to ethics, infrastructures, data and privacy protection and user-acceptance are also common denominators between the different groups. Therefore, there is synergy among the four groups that should be further explored. The four expert groups of the IDIH project will exchange views and ideas for the AHA domain taking into account the common issues and particularities of each group. For that purpose, a physical meeting between members from all expert groups is key and necessary as networking is crucial. Furthermore, it is critical to engage User groups into the discussions. This was especially a challenge that has been experienced by all four groups taking form in a virtual meeting instead of a physical one. The extension of the discussion point and the length of the meetings have had also to be adapted. Therefore, some of the questions have been raised at the initial and first meeting that will be further deepened in the next meeting.

The following actions will be undertaken:

- Prepare the workshop proceedings and send out to all 4 expert groups the report for validation
- Define and agree on regular communication and information exchange
- Standardised template to collect experts' profile/expertise a) to highlight their profiles on the IDIH website and b) IDIH poster
- Establish internal platform for communication amongst experts in this group and between the different expert groups e.g. to share relevant information, articles, links, opportunities for collaborations among the EU and the strategic partner countries.
- Proposition of future topics to be discussed in future expert meetings a) that were not completely covered in the first meeting, b) topics that are leading to the next steps in the action plans.
- Propose possible future topics for webinars e.g. expert group shall examine the possibility of organising a Covid-19 thematic session.
- Identification on more flexible video-conferencing tools, that are accessible for all experts. It is likely that until the first half of 2021 only virtual meetings will be possible. The idea is also to be able to have parallel sessions that allow also interaction between experts of the different groups. Generally, a combination of virtual and physical meetings could be an option to allow expert to join without travelling.

Furthermore, expert groups shall focus on key differences between regions, for example China is very rural, that need to be taken into account, trying to define a set of requirements incorporating the diversity of the IDIH strategic countries. The expert groups shall work towards proposing specific measures for collaboration around key areas (such are joint funding, common policies, etc). A dialogue will be initiated in the forthcoming meetings to address the need for international collaboration that is a key especially on technological issues and testbeds.

## 6. ANNEX

### 6.1 Expert meeting agendas

#### 6.1.1 Expert Group I Preventive Care: Agenda of the expert meeting

Date: 18<sup>th</sup> May 2020 / Time: 16.00 – 18.00 CET

Copy of Agenda(s):

Slot 1: Current State of Play		
Topic	Duration (in mins)	Responsible
Welcome Speech	5	Facilitator & Chair
Tour de table (7*5mins)	35	Experts & Facilitator
Project & EG Overview	10	Facilitator
Current Status (per country/region) (6*15 mins): Existing Technologies, Platforms, Policies, Research	90	Experts
Wrap-up & QA	10	Experts & Facilitator

Slot 2: Future Development & Requirements		
Topic	Duration (in mins)	Responsible
Welcome Speech	5	Facilitator & Chair
Define EG's area scope: common understanding - statement	20	Chair & Experts
Requirements & Needs for Future development per User Group/Application area: Individuals, Professionals, Organizations (6*20mins)	120	Experts
Wrap-up & QA	10	Experts & Facilitator

Slot 3: International Collaboration & Next Steps		
Topic	Duration (in mins)	Responsible
Welcome Speech	5	Facilitator & Chair
Areas of Opportunity for International Collaboration: Research & Technology (6*8 mins)	48	Experts
Areas of Opportunity for International Collaboration: Policy (6*8 mins)	48	Experts
Extra topic: Covid-19	20	Chair & Experts
Action Plan & Next Steps	20	Facilitator & Chair
Wrap-up & QA	10	Experts & Facilitator

To allow the experts to participate in the virtual meeting, we have organised the first online meeting at 4 PM CET (7 AM Canadian Time and 10 PM Chinese time).

We have then decided to carry out the next steps of the discussion through a Google doc and a Google Form, where to collect the feedback and the inputs of the Experts. Slot 2 and Slot 3 have then been transformed in an online remote contribution.

### 6.1.2 Expert Group II Integrated Care: Agenda of the expert meeting

The expert workshops have been divided into two sessions in order to accommodate the availability of the experts and time zones in both parts of the hemisphere. Furthermore, the experts have been provided with the reports before the meetings which allowed to merge the timeslots into a condensed meeting of 3 hrs per group still handling the topics foreseen as described below.

Date: 5<sup>th</sup> June 2020 (Time: 09:00 – 12:30 CEST) and 8<sup>th</sup> June 2020 (Time: 15:30 – 18:30 CEST)

Slot 1: Current State of Play		
Topic	Duration (in mins)	Responsible
Welcome Speech	5	Facilitator & Chair
Tour de table (7*5mins)	35	Experts & Facilitator
Project & EG Overview	10	Facilitator
Current Status (per country/region) (6*15 mins): Existing Technologies, Platforms, Policies, Research	90	Experts
Wrap-up & QA	10	Experts & Facilitator
Slot 2: Future Development & Requirements		
Topic	Duration (in mins)	Responsible
Welcome Speech	5	Facilitator & Chair
Define EG's area scope: common understanding - statement	20	Chair & Experts
Requirements & Needs for Future development per User Group/Application area: Individuals, Professionals, Organizations (6*20mins)	120	Experts
Wrap-up & QA	10	Experts & Facilitator
Slot 3: International Collaboration & Next Steps		
Topic	Duration (in mins)	Responsible
Welcome Speech	5	Facilitator & Chair
Areas of Opportunity for International Collaboration: Research & Technology (6*8 mins)	48	Experts

Areas of Opportunity for International Collaboration: Policy (6*8 mins)	48	Experts
Extra topic: Covid-19	20	Chair & Experts
Action Plan & Next Steps	20	Facilitator & Chair
Wrap-up & QA	10	Experts & Facilitator

### 6.1.3 Expert Group III Independent and connected living: Agenda of the expert meeting

As the Independent and Connected Living Expert Group (EG) was unable to meet in-person, the first meeting was split into three sessions to accommodate for the time zone differences. Each session was approximately 2-2.5 hours conducted over a Zoom Video Conference. The sessions were facilitated by Catalyst and the EG Chair, Dr. George Demiris (US).

Date / Time:

1. 3<sup>rd</sup> June 2020 / Time: 8:00 -10:30 AM EST
2. 12<sup>th</sup> June 2020 / Time: 8:00 -10:00 AM EST
3. 26<sup>th</sup> June 2020 / Time: 8:00 -10:00 AM EST

Agenda:

Session	Duration
June 3 <sup>rd</sup> , 2020 <ul style="list-style-type: none"> <li>• Introductions (10 mins)</li> <li>• IDIH Project Overview (10 mins)</li> <li>• “Current State of Play” Presentations + Q&amp;A (1 hr 30 mins)               <ul style="list-style-type: none"> <li>○ Canada</li> <li>○ United States</li> <li>○ Japan</li> <li>○ Korea</li> <li>○ China</li> </ul> </li> <li>• Review Independent &amp; Connected Living Action Plan (10 mins)</li> <li>• Next Steps (5 mins)</li> </ul>	2.5 hours
June 12 <sup>th</sup> , 2020 <ul style="list-style-type: none"> <li>• Feedback on Action Plan Draft (5 mins)</li> <li>• Presentation on Italy/EU “Current State of Play” (20 mins)</li> <li>• Presentation on Japanese IoT Experience (10 mins)</li> <li>• Define Independent &amp; Connected Living Scope (15 mins)</li> <li>• Expand and discuss list of tech/services (60 mins)</li> <li>• Next Steps (10 mins)</li> </ul>	2 hours
June 26 <sup>th</sup> , 2020 <ul style="list-style-type: none"> <li>• Narrowing/ranking focus areas (25 mins)</li> <li>• Research and Innovation Challenges (40 mins)</li> </ul>	2.5 hours

<ul style="list-style-type: none"> <li>○ What research exists?</li> <li>○ What research needs to be done?</li> <li>● Discussion on Policy Gaps (40 mins)           <ul style="list-style-type: none"> <li>○ Funding/reimbursement</li> <li>○ Care delivery structure/models</li> </ul> </li> <li>● Identify Areas of Opportunity for International Collaboration (40 mins)</li> <li>● Next Steps (5 mins)</li> </ul>	
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### 6.1.4 Expert Group IV Inclusive Living: Agenda of the expert meeting

The first Inclusive Living EG meeting took place virtually into two different sessions, due to the different time zones, it was impossible to synchronise among all experts. The facilitator of the Group (Vasilis Papanikolaou) and the Chair of the Group (Matthew Lariviere) attended both sessions. It is also critical to mention, that the Japanese representative (Pr. Satoko Hotta) couldn't attend any of the two sessions, as due to the Covid-19 emergency she is obligated to give priority to national initiatives, at least for the following months to come. However, we are in the process to arrange a one to one follow up to discussion, according to her availability.

#### Session 1: EU-USA-S.Korea

**Date:** 28th May 2020 // Time :10:00 – 13:00 CEST

#### **Copy of Agenda(s):**

Topic	Duration (in mins)	Responsible
Welcome Speech	5	Vasilis Papanikolaou Matthew Lariviere
Tour de table	10	All
Project & EG Overview	10	Vasilis Papanikolaou
EU Expert Presentation  Topics: 1. Definition of "Inclusive Living" 2. Current Status per country/region: policies, programmes, platforms, funding agencies, etc. 3. Existing technologies which you feel support inclusive living 4. Requirements for future development designed to support: individuals (older people, families, unpaid carers), health and care professionals, and organisations 5. Areas of collaboration: research/evaluation, technology, and policy	30	Matthew Lariviere
US Expert Presentation	30	Mandy Salomon

Topics: 1. Definition of "Inclusive Living" 2. Current Status per country/region: policies, programmes, platforms, funding agencies, etc. 3. Existing technologies which you feel support inclusive living 4. Requirements for future development designed to support: individuals (older people, families, unpaid carers), health and care professionals, and organisations 5. Areas of collaboration: research/evaluation, technology, and policy		
S.Korean Expert Presentation  Topics: 1. Definition of "Inclusive Living" 2. Current Status per country/region: policies, programmes, platforms, funding agencies, etc. 3. Existing technologies which you feel support inclusive living 4. Requirements for future development designed to support: individuals (older people, families, unpaid carers), health and care professionals, and organisations 5. Areas of collaboration: research/evaluation, technology, and policy	30	Roland Wilson
Extra topic: Covid-19 and its relation to inclusive Living	15	All
Action Plan & Next Steps	15	Vasilis Papanikolaou
Wrap-up, Q&A	10	Vasilis Papanikolaou Matthew Lariviere

## Session 2: EU-China-Canada

**Date:** 06<sup>th</sup> June 2020 / **Time:** 21:00 – 00:00 CEST

### **Copy of Agenda(s):**

Topic	Duration (in mins)	Responsible
Welcome Speech	5	Vasilis Papanikolaou Matthew Lariviere
Tour de table	10	All
Project & EG Overview	10	Vasilis Papanikolaou





EU Expert Presentation	30	Matthew Lariviere
<p>Topics:</p> <ol style="list-style-type: none"> <li>1. Definition of "Inclusive Living"</li> <li>2. Current Status per country/region: policies, programmes, platforms, funding agencies, etc.</li> <li>3. Existing technologies which you feel support inclusive living</li> <li>4. Requirements for future development designed to support: individuals (older people, families, unpaid carers), health and care professionals, and organisations</li> <li>5. Areas of collaboration: research/evaluation, technology, and policy</li> </ol>		
China Expert Presentation	30	AJ Chen
<p>Topics:</p> <ol style="list-style-type: none"> <li>1. Definition of "Inclusive Living"</li> <li>2. Current Status per country/region: policies, programmes, platforms, funding agencies, etc.</li> <li>3. Existing technologies which you feel support inclusive living</li> <li>4. Requirements for future development designed to support: individuals (older people, families, unpaid carers), health and care professionals, and organisations</li> <li>5. Areas of collaboration: research/evaluation, technology, and policy</li> </ol>		
Canadian Expert Presentation	30	Habib Chaudhury
<p>Topics:</p> <ol style="list-style-type: none"> <li>1. Definition of "Inclusive Living"</li> <li>2. Current Status per country/region: policies, programmes, platforms, funding agencies, etc.</li> <li>3. Existing technologies which you feel support inclusive living</li> <li>4. Requirements for future development designed to support: individuals (older people, families, unpaid carers), health and care professionals, and organisations</li> <li>5. Areas of collaboration: research/evaluation, technology, and policy</li> </ol>		
Extra topic: Covid-19 and its relation to inclusive Living	15	All
Action Plan & Next Steps	15	Vasilis Papanikolaou
Wrap-up, Q&A	10	Vasilis Papanikolaou Matthew Lariviere

## 6.2 List of Experts

### 6.2.1 Expert Group I Preventive Care: List of Experts of first meeting

Table 1: Preventive Care EG Members

Name	Organisation	Country represented
Giovanni Saggio	Università di Tor Vergata	EU
Steven Charlap	GeneYes	US
Yiqiyang Chen	Institute of Computing Technology, Chinese Academy of Sciences	China
Weihong Song	University of British Columbia	Canada
Hye-Jin Kim	Columbia University	South Korea

### 6.2.2 Expert Group II Integrated Care: List of Experts of first meeting

Table 2: Integrated Care EG Members

Name	Organisation and Position	Country represented
Kendall Ho	Professor at the Department of Emergency Medicine, University of British Columbia Lead at Digital Emergency Medicine Unit Executive Director, Inter-Cultural Online Health Network Academic Director, Community Cloud Innovation Centre, University of British Columbia	Canada
Yanchun Zhang	Professor at Cyberspace Institute of Advanced Technology, Guangzhou University, China Director at the Centre for Applied Informatics, Victoria University, Australia	China
Ville Salaspuro (M.D., Ph.D)	Medical Director/Board member at Mediconsult Oy	Finland
Kanoko Oishi (excused to 1st meeting)	Founder and director of Mediva Inc.	Japan
Jisoo (Emily) Lee (Ph.D)	Founder & CEO at HealSage Consulting, Seoul	South Korea
Christopher Gorton (M.D)	Director and Investor at MEDSOLIS, LLC, Frisco, TX	USA
Pantelis Angelidis (excused to 1st meeting)	Chairman of the Board, HAMAC, Hellenic Association of Mobile Application Companies	Greece
Isabel Van De Keere	Founder and CEO at Immersive Rehab Ltd	United Kingdom
Shiv Dua (excused to 1st meeting)	West Penn Hospital – Director of Research and Innovation, Department of emergency medicine	USA

	Allegheny Health Network – Chief Resident, Department of emergency medicine	
Abhishek Pratap (excused to 1st meeting)	Principle Research Scientist, Sage Bionetworks	USA

### 6.2.3 Expert Group III: Independent and connected living - List of Experts of first meeting

Table 3: Independent & Connected Living EG Members

Name	Organisation	Country represented
George Demiris, PhD FAMI	Penn Integrates Knowledge University Professor, Department of Biobehavioral Health Sciences University of Pennsylvania	United States
Robyn Tamblyn, MScN, M.Sc., PhD, CM	Senior Scientist, RI-MUHC Cardiovascular Health Across the Lifespan Program Centre for Outcomes Research and Evaluation  Professor, Department of Medicine, Faculty of Medicine, McGill University	Canada
Matteo Melideo	Research and Innovation Manager Engineering Ingegneria Informatica SpA	Italy
Guilan Kong, PhD	Associate Research Professor National Institute of Health Data Science, Peking University	China
Hirohisa Hirukawa, PhD	Assistant Director General Department of Information Technology and Human Services, National Institute of Advanced Industrial Science and Technology (AIST)	Japan
Kyoung Eun (Kelly) Lee, PhD, MSN, WHCNP, RN	Assistant Professor College of Nursing & Health Sciences, Texas A&M University - Corpus Christi	Korea (based in the US)

## 6.2.4 Expert Group IV: Inclusive Living - List of Experts of first meeting

Table 4: Inclusive Living EG Members

Name	Organisation	Country represented
Matthew Lariviere UKRI Innovation Fellow on Care, Ageing and Technology, Centre for International Research on Care, Labour and Equalities	University of Sheffield	EU
Mandy Salomon CEO	Mentia Inc.	US
AJ Chen Visiting Professor	West China Hospital	China
Habib Chaudhury Professor and Chair in the Department of Gerontology,	Simon Fraser University	Canada
Roland Wilson Founder and Co-Director of Peace and Conflict Studies Center Asia (PACSC Asia)	George Mason University, Korea Campus	S. Korea
Satoko Hotta Board Member, Health and Global Policy Institute	Health and Global Policy Institute	Japan