Scaling-up of ICT Solutions in Active and Healthy Ageing through Twinning Actions

Strahil Birov[a], Christianne Lavin[b] and Veli Stroetmann[c]

empirica Gesellschaft für Kommunikations- und Technologieforschung mbH, Oxfordstr. 2, Bonn, Germany

Keywords: ICT, Active and Healthy Ageing, Scaling-up Strategy, Digital Innovation, Twinnings.

Abstract: Despite an increase in life expectancy in today's rapidly ageing society, unhealthy life years still make up a big portion of a person's life. Digital innovations in health and care services need to be scaled up to enable more citizens to access and lead healthy, active and independent lives while ageing. Under the EU funded ScaleAHA study, a twinning scheme was conducted to scale up ICT solutions in active and healthy ageing. Forty-three organisations from thirteen European countries have successfully participated in financed twinning actions ranging from knowledge exchange and training to full adoption and acquisition of an innovative practice. Twinning topics included EHRs, ePrescription solutions, integrated health and social care ICT service platforms, and homecare and telemonitoring solutions, among others. The twinning scheme was a new concept that aimed to de-risk investment in innovative ICT solutions by financing small but concrete ideas with high potential for replicability and scaling up. The twinnings led to benefits for the participating organisations themselves as well as various stakeholders such as patients and their carers, healthcare providers and regional authorities. This paper presents the results and lessons learnt from the twinning scheme and recommendations to further refine future twinning actions.

1 INTRODUCTION

Scaling up digital innovations in health and care services in Europe enables more EU citizens to lead healthy, active and independent lives while ageing, whilst improving the sustainability and efficiency of health and social care systems and boosting and improving the competitiveness of the markets for innovative products and services. By scaling up digital innovations, the EU Member States are responding to the ageing challenge at both EU and global level, while creating new opportunities for businesses.

In order to successfully scale up digitally-enabled innovative solutions, a comprehensive scaling-up strategy at European level is needed. The European Commission, supported by the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA), has defined a five-step scaling-up strategy in AHA by: building a database of innovative practices, their viability assessment regarding scaling-up potential, their classification for replication purposes, the facilitation of appropriate partnerships, and implementation of the innovative practices in other regions and countries (European Commission, 2015).

Since its inception in 2010, the EIP on AHA has shown considerable progress with regards to the first three steps of the strategy. A repository of innovative practices of the EIP on AHA contains more than 400 good practices across Europe. Each practice is detailed and assessed via key performance indicators (time for deployment, investment, maturity, available evidence of outcomes, impact, transferability) in order to help the more than 1,000 stakeholders of the EIP on AHA identify collaboration opportunities.

With this foundation in place, the EIP on AHA is in the process of implementing the good practices through collaboration and partnership search. Working together, stakeholders exchange knowledge and share the experience of successful innovations to facilitate their scaling up across Europe. One important instrument promoted by the European Commission to facilitate this step of the scaling-up strategy is the use of twinning actions. In this paper,

[a] https://orcid.org/0000-0002-4575-0492

[b] https://orcid.org/0000-0001-8348-4642

[c] https://orcid.org/0000-0001-8601-5307

a twinning action or "twinning" refers to the transfer of an innovative Information and Communication Technology (ICT) solution (also referred to as the "innovation" or "innovative practice" and can be a product, service, methodology, or strategy) from one region to one or more other regions.

The "Transfer of Innovation Twinning Support Scheme" was a pilot scheme to support twinning actions by partners of the EIP on AHA through the reimbursement of expenses incurred in the transfer of innovative practices. It was part of the EU-funded "Support to scaling up of innovations in Active and Healthy Ageing" (ScaleAHA) study (ScaleAHA Consortium, 2016), which aimed to accelerate the scaling-up of innovative approaches and practices in Active and Healthy Ageing by fostering dedicated mentoring activities and active knowledge exchange among stakeholders of the EIP on AHA.

Two types of organisations could be involved in the twinning scheme: an *adopter* organisation and an *originator* organisation. The *adopter* is the organisation that received the innovation, *i.e.*, benefitted from the experience and know-how developed by the *originator* organisation in a particular field of intervention and aimed to deploy or implement this innovation in their territory. The *originator* is the organisation with the experience and know-how in a particular field of intervention. It is the organisation that transferred the innovation to the adopter.

2 APPROACH

The twinning scheme of the ScaleAHA study limited participation to organisations holding Reference Site (RS) status as a result of the 2016 Call for Reference Sites of the EIP on AHA. These "Reference Sites" are highly inspirational ecosystems, delivering creative and workable solutions that improve the lives and health of older people through the collaboration of different stakeholders. They are also able to give evidence and concrete illustrations of the impact of their approaches.

Applications to the scheme were possible through a "joint request" submitted through a brief online application form. It was filled in by the adopter and originator organisations together, with details on the requested twinning support, on the content of the twinning action, (notably on which innovative practice was planned to be transferred), and on the level of commitment for implementing the innovative practice within 2016-2018. The applications were reviewed by an independent panel based on a set of pre-defined award criteria.

Overall the twinning actions covered a wide range of eHealth topics, which are relevant to current health priorities. These included online health portals; ICT-supported integration of health and social care services; health and care needs assessment tools; ICT tools supporting adherence to care plans; mHealth systems; falls prevention; regional and national Electronic Health Record (EHR) systems and integration; ePrescription solutions; tele-mentoring and virtual consultations; multi-disciplinary team and care co-ordination; and age-friendly buildings, among others. The twinning innovations were also well-aligned with some topics related to the Digital Single Market priorities on transforming health and care (European Commission, 2018) such as health data analytics (risk stratification tools, mobile applications), citizen and patient empowerment (online self-management hub, citizen access to data, health data exchange and re-use, advanced platforms and infrastructure, and prevention and patient-centred care (innovations on telecare, home-monitoring, and digital skills and staff training solutions, among others).

The twinning organisations themselves were responsible for managing and organising any activity (*e.g.*, study visits, translation work) needed to carry out their twinning action and goals. The organisations were also requested to report to the ScaleAHA study team on the evolution of the innovative solution, the motivation behind the healthcare problem that the innovation addressed, any concrete plans on how the innovation was to be transferred, the progress of the twinning action, barriers and success factors experienced, any possible future co-development, benefits and new opportunities expected from the twinning action, whether the twinning resulted in implementation of the innovation in the adopter region, and any other outcomes that resulted from the twinning action. These reports were submitted twice in the form of one interim and one final report.

The twinning scheme provided financial support to cover the travel and accommodation of experts and other expenses incurred by hosting meetings (such as transport within the region). It did not cover fees for professional services (consulting, advisory services, moderation services etc.) and did not include the acquisition of products and services from third parties. The total maximum amount that could be claimed was capped at € 5,000 for each twinning action, irrespective of the number of adopter organisations involved in the respective twinning.

3 RESULTS

Twenty twinning proposals were accepted into the twinning scheme, composed of 43 twinning organisations from 26 Reference Sites in 13 countries across Europe (Figure 1).
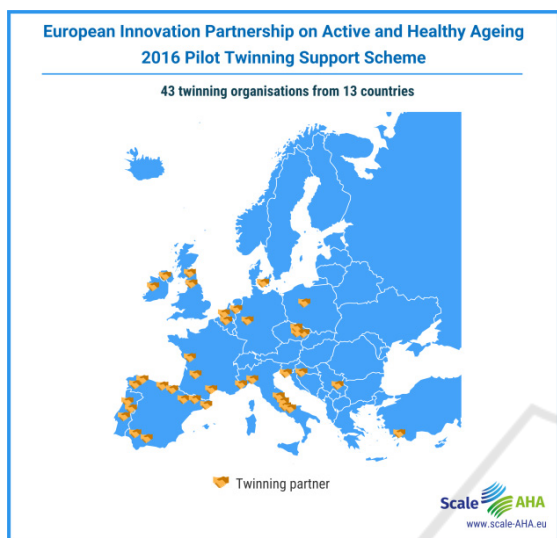

Figure 1: A total of 43 twinning organisations from 26 Reference Sites in 13 countries were accepted in the ScaleAHA Twinning Support Scheme.

Table 1: Overview of innovative practices accepted in the twinning scheme, and their respective originators.

Originators (Reference Site, Country) and their Innovative Practices Twinning Support Scheme (ScaleAHA project, 2016)	
Andalusia, Spain	SAT Telecare Service
Andalusia, Spain	Diraya eHealth Strategy
Basque Country, Spain	Predictive Modelling System and Risk Stratification Tool
Campania, Italy	ADD Protection home-monitoring system for early and protected hospital discharge
Galicia, Spain	IANUS regional EHR system and ePrescription solution
Lazio, Italy	Frail Survey baseline assessment of frailty application
MACVIA, France	MASK Allergy Diary
Medical Delta Rotterdam, The Netherlands	Gastrological approach and digital modular platform to prevent and treat malnutrition
Northern Ireland, UK	STEPSelect system for selection and procurement of medicines for the elderly
North West Coast of England, UK	Teleswallowing service delivery model to improve the assessment of swallowing
Pays de la Loire, France	ALOHA system for prevention of infectious diseases for the elderly
Republic of Ireland Regional Network (COLLAGE), Ireland	Quick Mild Cognitive Impairment (Qmci) screening application & RAPid Community COGnitive screening Programme – RAPCOG
Scotland, UK	Living it Up online hub for self-management of health and wellbeing
Twente, The Netherlands	Telerevalidatie.nl self-management platform for older adults & patients with chronic diseases

Fourteen innovative practices were accepted in the twinning scheme (Table 1).

The ScaleAHA study team collected and analysed the reports on the twinnings submitted by the originator and adopter organisations. The results of these analyses are found in the next sub-sections.

3.1 Barriers and Success Factors to Scaling up Innovation in AHA

The barriers and success factors to scaling up innovation in AHA were identified and collected based on the twinning experiences in order to present the key elements that hampered or enabled a smoother implementation of the innovative practice.

A lack of cooperative knowledge exchange between professionals resulted in a delay in the adoption of new practices, for instance, in Northern Ireland, where clinicians initially feared that they would lose their clinical freedom when using a new system. There were also difficulties in convincing stakeholders of the effectiveness of the new care pathways, which thereby slowed down the organisational change process. In some cases, the implementation of a new system required clinicians to first participate in educational programs and training, leading to time and effort-related barriers. It has been found to be challenging to address the target group, *i.e.*, present innovative eHealth systems to those aged 80 years and above. Poor interoperability among different health information systems and fragmentation of software applications among regions not only caused delays in adopting the innovation but also caused an increase in costs related to implementation. Technical barriers were also an

Figure 2: Overview of identified barriers to scaling up innovation in AHA.

issue in several regions, in which poor internet connectivity and multiple system crashes caused discomfort in the users, which in turn delayed user acceptance of the innovation.

Identifying and analysing the current state of research in a particular target topic as well as developing a clear vision on the use and benefits of a new product were found to be useful initial steps in implementing an innovative practice. Some of the innovations were implemented quickly because they fell in line with national strategies, guidelines and health plans. In Andalusia and Scotland, continuous political support helped overcome challenges in the implementation of innovative electronic health practices. Training and education of staff as well as user experience design and acceptability led to more efficient and widespread usage of the innovation. User acceptance was particular important for successful innovation and deployment and was achieved by placing a focus on outcomes that were important to the users. In Twente, the developers of the *Telerevalidatie.nl* online portal supporting rehabilitation at home were closely collaborating with the target group, thus being able to adopt a user-friendly and highly accepted digital solution. Similarly, while developing the Andalusian EHR, both technicians and the health workforce were involved in the design and successful implementation of the system. Financial incentives were identified to be catalysts for change, for example, in helping motivate doctors actively participate with other

Success factors to scaling up innovation in AHA

- Clear vision and strong political commitment
- Previous research and piloting
- Networking and collaboration
- Addressing current healthcare needs and embedding the new system into present healthcare policies
- Public and private partnerships
- New business models and innovations
- Training and education of staff
- Product development in close collaboration with the end-users
- User experience design, user acceptance
- Local services, integration of the new solution into the existing environment
- Faster benefit realisation of the innovative practices
- Marketing and business communication
- Funding, financial incentives and investments

Figure 3: Overview of identified drivers and success factors to scaling up innovation in AHA.

stakeholders in introducing new treatment pathways. Overall, networking, partnerships and collaboration also played a substantial role.

More specific examples on the identified success factors and barriers to scaling up innovation in AHA as experienced by specific twinning organisations are found in the ScaleAHA Final Study Report (empirica, 2017).

3.2 Twinning Archetypes and Experiences

In terms of scaling-up scope, the twinnings can be grouped into five archetypes: Knowledge exchange and training, Adaptation, Partial adoption, Full adoption, and Acquisition (described in Table 2).

Table 2: Twinning archetypes and corresponding number of twinning actions.

Type	Description	Number
Knowledge exchange & training, digital skills	Focus on knowledge (know-how) exchange and training, a central aspect of the innovation are the required staff skills	4
Adaptation	A mature innovation is being adopted by adjusting it to local conditions (e.g. translation into local language)	6
Partial adoption	Elements or aspects of the innovation (product, service, methodology, strategy) are being implemented using locally available infrastructure	8
Full adoption	The innovation (product, service, methodology, strategy) is being implemented in its full scope by using local infrastructure *i.e.* the innovation is transferred and managed fully by the adopter	1
Acquisition	The innovation is being implemented in its full scope by using the originator's infrastructure (paid for or free of charge), *i.e.* the originator still has primary ownership, but a license for use is granted to and acquired by the adopter	1

The Knowledge exchange phase was usually achieved within 3 months, and for many cases partial adoption of the innovative practice was achieved after 6 months. Full acquisition of the innovative practice took longer than 6 months since a pilot phase of at least 12 months was usually required in order to study the usability and adaptability of the ICT tools (*e.g.,* assessing potential clinical effect, measuring adherence to treatment, measuring user's satisfaction).

Examples of steps done within 6 months that led to the implementation of the innovation include:

- Organising various meetings for knowledge transfer such as analysing the situation of the

adopter site and analysing how to improve and adjust the existing infrastructure;

- Setting up working groups that analyse the innovative solution and detect what changes or improvements are necessary;
- Translating content into the language of adopter site (*e.g.,* in mobile applications or portals);
- Planning and designing future implementation (*e.g.,* creating roadmaps and study methodologies on how to involve more citizens and stakeholders); and
- Finding sponsors for and implementing a small-scale pilot *e.g.*, at a hospital level.

The twinning organisations that successfully implemented the innovative practice given the twinning timeframe were able to do so due to the lack of political or financial barriers even before the twinning. In these cases, the organisations were able to already focus on expanding their reach of potential users (through publishing in magazines; using social networks; using colourful, captivating icons in their health platforms to attract a wider audience; etc.).

One of the success stories is the *MASK Allergy Diary* twinning action, which was fully implemented (full acquisition) initially by 10 adopter regions during the twinning scheme (empirica, 2017) followed by altogether 30 adopter regions (Bousquet, 2017). *MASK Allergy Diary* is a tool that enables citizens to assess and control allergic rhinitis, and supports pharmacists, physicians and specialists in prescribing appropriate treatment and follow-ups. Through the outreach of the adopter Reference Sites (who aimed to recruit at least 50 elderly persons ≥65 years and at least 100 adults <65 years in more than 20 countries) the twinning allowed the originator to study, compare, and analyse the differences in the characteristics of rhinitis and asthma multimorbidity among different age groups across different countries (Bousquet, 2017). This twinning action not only provided more citizens with access to a proven allergy management tool, but also gave way to multiple avenues of future research on rhinitis and asthma that can be gained from the collected data.

Most of the twinnings led to an adoption of elements of the innovation using the local infrastructure (partial adoption). Partial adoption did not necessarily mean an incomplete adoption. In some cases, a partial adoption was preferred over a full adoption since an efficient local infrastructure was already in place in the adopter region. An example of a success story of partial adoption is the Andalusia-Zagreb twinning (empirica, 2017). The adopter (Zagreb) participated in the twinning to find digital solutions related to AHA that could be piloted

or implemented in the Zagreb RS. The twinning enabled the Zagreb RS to co-develop workshops with primary care physicians and ICT service providers in order to find the best ways to implement elements of the Diraya eHealth system (Regional Ministry of Health Andalucia, 2016) to the Croatian healthcare ecosystem. As a result, a set of modules was added to the already existing health service of the adopter, *Zdravlje.net*. The e-Consultation module was one of the notable elements implemented through the twinning. It fostered collaboration between cure and care sectors and thus provides a multidimensional approach to managing patients. Through this module, each patient can receive recommendations for managing a specific health issue based on the multidisciplinary interaction of general practitioners and hospital specialists. The number of citizens using *Zdravlje.net* has been increasing and strongly indicates possibilities to reach out to all current inhabitants of Zagreb.

3.3 Benefits and New Opportunities

The adopter organisations have identified a number of benefits and new opportunities resulting from the adoption of digital innovations through the twinning actions. The specific examples below are meant to provide a better understanding of the benefits experienced mostly by the adopter region. These examples are not exhaustive.

Better Healthcare Service – for example, the Basque Country Risk Stratification Tool (Orueta, et al., 2013) enables patients with specific diseases to be identified, selected, and precisely grouped, giving the patient a more coordinated, proactive, and personalised level of healthcare. The tool also collects demographic, socioeconomic and clinical variables from sources such as the Department of Health into summarised, relevant information that supports healthcare providers in their clinical decisions.

Timely Diagnosis and Better Screening – The Quick Mild Cognitive Impairment (Qmci) screening application (Collaboration on Ageing, 2016) has been developed as a computerised application that reduced paper work and data entry, and generated a more accessible and flexible screening process. It will be used to rapidly identify patients with Mild Cognitive Impairment and dementia who can benefit from early intervention.

Better Communication between Professional and Patient/Patient's Family – The Andalusian Telecare Service (SAT) (ASSDA, 2016) has enabled easier and more personal communication between doctor and patient due to its easily accessible setup: a

bracelet device that can be worn by the patient at home and is connected to a device in the healthcare centre that contains all patient information. The service allowed patients to stay at their own homes, which has also led to a bigger involvement of family members in the patients' care.

Improved Health Literacy – the *ALOHA* e-Health platform (Gerontopole Pays de la Loire, 2016) provides information on vaccination, nutrition, and controlled use of antibiotics for the senior population. Improving the patients' awareness on such health topics can lead to better participation in their medical plans.

Better Resource Allocation – adopting a transparent medicines procurement strategy using the StepSelect system (Scott, et al., 2010) prevents the dispensation of unnecessary medicines, which therefore leads to cost savings that could be used to further improve the health system.

Collection and Evaluation of Data that is by far still Unavailable in the adopter site – the *FrailSurvey* mobile app (University of Rome, 2016) enables the collection of data and the subsequent evaluation of the prevalence of frailty in the region. This was beneficial for the adopter region (Porto), in which there had not yet been data on frailty prevalence. The possibility of including frailty status in the patient care model was also explored.

Other benefits and new opportunities included improved national sustainability due to massive cost savings; reduced healthcare visits; development of healthcare services for complex patients; new job opportunities or roles for health professionals; patient empowerment; the creation of new businesses, business models and new areas of research and development; and stronger relationships between the Reference Sites and the possibility of future impactful collaborations.

In some cases unforeseen benefits or "spill-over effects" were observed. These are events that were "inspired" by the twinning action, although not initially planned. For example, one twinning action involving the adoption of a telecare service had such a positive effect on the adopter organisation's team that the adopters were inspired to develop another type of service - a local call centre directed at solving issues among the younger population. Some twinnings also led to calls for developing other solutions that would support the implementation of the organisator's innovation into the adopter region. One of the twinnings resulted to not only in a transfer of the innovative practice from the originator to the adopter site but also from the adopter to the originator site.

Furthermore, some of the twinning organisations participated as both originator and adopter in separate twinning actions. They reported benefits for the originator as well, such as having an improved internal communication, local coordination and networking; receiving external positive feedback as an incentive; and being able to update knowledge and documentation of their innovative practice.

4 SUMMARY AND RECOMMENDATIONS

Overcoming implementation barriers and leveraging success factors for scaling up drives innovativeness in active and healthy ageing. ScaleAHA has taken stock of and analysed key barriers and success factors for scaling-up of healthcare solutions in Europe. Some barriers faced during the twinning scheme were technical differences in infrastructure *e.g.,* internet access, lack of interoperability and system integration, low digital literacy of the target group, financial and reimbursement problems, and lack of awareness among professionals and patients. Among the key success factors are strong political commitment; utilising existing networks, partnerships and collaborations; putting the user in the centre of the development and the overall process to ensure acceptance; leveraging public and private partnerships and funding mechanisms; disseminating the benefits of the innovations; and providing appropriate training and education to staff.

The twinnings have given rise to a number of benefits and new opportunities resulting from the adoption or planned implementation of the innovation, not only for the adopter but also for the originator. Each twinning has accomplished different implementation steps regardless of their archetype within the project timeframe. For many cases, a partial adoption has been achieved after 6 months, which generally involved organising various meetings for knowledge transfer, creating relevant working groups and multidisciplinary teams, translation of ICT tools into the language of the adopter site, and finding sponsors or even beginning the necessary pilot phase.

Examples of lessons learnt that facilitated the twinning actions included establishing a clear twinning plan and identifying adopter prerequisites early on in the timeframe; creating pilot projects to address areas of improvement in the adopter region; and creating more joint activities and training sessions to enable knowledge acquisition not just for

the adopter region but also for the originator region. The different twinning archetypes required different budget and financing but overall there was an own budget of 1 million EUR invested by the adopters.

Recommendations provided by the twinning organisations in order to further refine the management of future twinning actions include extending the twinning timeframe, also considering the schedules of the different staff involved in the twinning; making all necessary templates for reporting available well in advance; keeping the overall process simple (application, reporting, etc.); increasing the twinning budget in order to extend the scope of activities; and extending the budget to cover other expenses such as staff participation, development and implementation costs.

Furthermore, the following observations should also be considered for future twinnings:

- The twinning scheme should have a dedicated online presence, which includes a list of ongoing twinnings and regular news about their progress, as well as information about any upcoming calls;
- Provide evidence of impact and communicate the benefits from twinning actions;
- Launch Calls for Twinnings based on current and upcoming EC priorities. Upcoming twinning calls may be used strategically to stimulate areas which are of priority to the EC or areas which are underfunded but promise high impact, such as the priority health areas described in the Organisation for Economic Co-operation and Development (OECD) Health at a Glance: Europe reports (OECD/EU, 2018). Such selective funding will allow to target digital innovations more effectively and to close existing gaps.
- Twinnings should be placed in future European Union funding programmes. By placing particular requirements in the calls related to twinning actions, the EC can further stimulate the scheme; and
- The impact of the twinnings should be captured in a uniform way. The described twinning scheme has delivered evidence of what works well and can provide high impact. This evidence was highlighted by the establishment of a clear commitment between the twinning organisations backed up by political support and additional budget that was secured from local funds. The impact of twinnings can be captured more efficiently if assessed with a uniform impact assessment tool.

5 CONCLUSIONS

Overall the twinning scheme carried out by the ScaleAHA study was a new concept that aimed to de-risk investment in digital innovative ICT solutions by financing small but concrete ideas with high potential for replicability and scaling up. The scheme was an excellent instrument for targeting barriers in line with current Digital Single Market health and care priorities and providing digital solutions that can be applied across Europe. Twinnings provide inspirational organisations and ecosystems with opportunities to learn from each other and deploy and scale up their solutions to other regions. The twinning actions also served as a stepping stone for further commitment among regions to continue working together and ensure the implementation of the solution even after the given twinning timeframe. The recommendations listed above were based on the twinning experiences in the ScaleAHA study to further refine possible future twinning actions. Although the ScaleAHA study focused on ICT solutions for active and health ageing, the twinning scheme itself is replicable and can be deployed for various other settings. Following the ScaleAHA twinnings, the European Commission has encouraged their use in other initiatives, including the EU project WE4AHA (WE4AHA consortium, 2019), as well as two new EU projects launched in January 2019.

ACKNOWLEDGEMENTS

REFERENCES

ASSDA, 2016. *Andalusian Telecare Service.* [Online]. Available at: https://ec.europa.eu/eip/ageing/reposi tory/andalusian-telecare-service_en. [Accessed 17 12 2018].

Bousquet, J., 2017. *Transfer of innovation on allergic rhinitis and asthma multimorbidity in the elderly (MACVIA-ARIA) - EIP on AHA Twinning Reference Site (GARD research demonstration project),* s.l.: John Wiley and Sons Ltd..

Collaboration on Ageing, 2016. *RAPid Community COGnitive screening programme.* [Online]. Available at: https://ec.europa.eu/eip/ageing/repository/rapid-community-cognitive-screening-programme_en. [Accessed 17 December 2018].

empirica, 2017. *Study on support to scaling-up of innovations in Active and Healthy Ageing.* [Online]. Available at: http://www.scale-aha.eu/fileadmin/scaleaha/documents/scaleaha_d5.4_finalstudyreport.pdf. [Accessed 13 December 2018].

European Commission, 2015. *European Scaling-Up Strategy in Active and Healthy Ageing.* Luxembourg: Publications Office of the EU.

European Commission, 2018. *Transformation of Health and Care in the Digital Single Market. COM/2018/233*

Gerontopole Pays de la Loire, 2016. *ALOHA, the Active and Healthy Ageing Academy.* [Online]. Available at: https://ec.europa.eu/eip/ageing/repository/aloha-active-and-healthy-ageing-academy_en. [Accessed 14 December 2018].

OECD/EU, 2018. *Health at a Glance: Europe 2018: State of Health in the EU Cycle,* Paris: OECD Publishing.

Orueta, J. et al., 2013. Predictive risk modelling in the Spanish population: a cross-sectional study, s.l.: BMC Health Services Research.

Regional Ministry of Health Andalucia, 2016. *Andalusian eHealth Strategy & System (DIRAYA).* [Online] Available at: https://ec.europa.eu/eip/ageing/repository/andalusian-ehealth-strategy-system-diraya_en. [Accessed 18 February 2019].

ScaleAHA Consortium, 2016. *ScaleAHA "Support to scaling up of solutions in Active and Healthy Ageing".* [Online]. Available at: http://www.scale-aha.eu/home.html. [Accessed 04 December 2018].

Scott, M., McElnay, J. & Janknegt, R., 2010. *Safe Therapeutic Economic Pharmaceutical Selection (STEPSelect): development, introduction and use in Northern Ireland,* s.l.: EJHP Practice

University of Rome, 2016. *About the Baseline Assessment of Frailty application.* [Online]. Available at: https:// ec.europa.eu/eip/ageing/repository/baseline-assessment-frailty-application_en. [Accessed 18 December 2018].

WE4AHA consortium, 2019. *WE4AHA.* [Online]. Available at: https://cordis.europa.eu/project/rcn/211372/en. [Accessed 4 January 2019].