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1. Executive Summary

Active and healthy ageing is a major societal challenge common to all European countries and an area, which presents considerable potential for Europe to provide innovative responses. Under this premise, the European Commission launched in 2012 the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) to enable EU citizens to lead healthy, active and independent lives while ageing; improve the sustainability and efficiency of social and health care systems and boost the competitiveness of the markets for innovative products and services in this field, thus securing a triple win for Europe.

Four year after its launch, the Partnership works as a coherent whole, like interlinked cogs in a well-oiled machine. The expertise, sharing of relevant experiences and work conducted by its key stakeholder partners (end users, public authorities, academia, industry) has led to innovative solutions for active and healthy ageing, that in some cases have the potential to be scaled-up at European level.

As part of the prevention, screening and early diagnosis pillar of the EIP on AHA, non-adherence has been highlighted as a global issue of public health concern, not only because adherence to long-term therapies for chronic illnesses in developed countries averages 50%, but because it has the potential to compromise the effectiveness of treatments and has a great impact on healthcare budgets.

This booklet provides an overview of the work conducted from 2012 to 2015 by the Action Group on Prescription and Adherence to Medical Plans – Action Group A1 – in order to improve the quality of life and health outcomes of older people living with chronic conditions through a holistic approach.

The work undertaken tackles non-adherence from a diversity of angles: by improving adherence to medical plans; empowering caregivers and patients to take care of their health; delivering improvements to the healthcare system; improving existing data evidence on ageing and adherence and fostering communication between stakeholders. In addition, partners have highlighted the importance of addressing non-adherence in patients with multiple chronic conditions – multimorbidity – that consequently use multiple medications – polypharmacy.

This multidisciplinary approach impacts upon each step of the patient's journey through the healthcare system. In this respect, a strong focus has been put on appropriateness of prescription from the development of decision-support tools, medication review and reconciliation protocols to the use of ICT technologies for prescribing (e.g. electronic prescription) and monitoring adherence. Health literacy and lifestyle interventions aiming to empower patients and caregivers, training programmes for healthcare professionals and web-based social platforms have also been in the centre of the work of the Action Group. Furthermore, efforts have been deployed on gathering evidence on adherence indicators and measuring the efficacy and effectiveness of interventions to improve medication adherence.

The work conducted by the Adherence Group aims to be the foundation on which it will be possible to start building new strategies to tackle non-adherence.
2. Rationale of Prescription and Adherence to Medical Plans Action Group

Over the last century, Europe has experienced a considerable economic development, improved living conditions and great advances in medical sciences leading to more effective healthcare systems. These factors have contributed to the emergence of a new situation in beginning of the third millennium: Europe is facing a completely new demographic challenge.

The increased percentage of older people in Member States may be perceived both as an opportunity for the boost of Silver Economy as well as a source of continuous rise of healthcare and social security costs. Regardless of which of these two perspectives one adopts, the consequences of this demographic challenge for national healthcare systems are acute. Older people represent a large proportion of the population affected by chronic diseases or multiple chronic diseases. Therefore, in order to adapt and get ready to respond to the needs of these new patients, European healthcare systems’ design has to be revisited and redefined.

Safe and effective treatments for a range of chronic conditions are widely available in Europe. However, the effectiveness and cost-effectiveness of these treatments is dependent on patient adherence. Adherence is defined as the level to which patient behaviour coincides with treatment plan that has been mutually agreed with healthcare professionals. This includes lifestyle factors, such as diet, and physical activity. Of the utmost importance, however, is the adherence to medication – a sine qua non condition of positive outcomes.

Economic impact of non-adherence in older people is substantial. Particularly in this age group, non-adherence results in increased hospitalisations and readmissions, as well as in the misuse of resources and adverse medical outcomes. All these make this phenomenon a major concern for public health. However, these consequences are in many instances preventable.

The evidence arising from existing research does not support one single intervention to solve the puzzle of medication non-adherence in older patients. Fortunately enough, a large number of approaches targeting different steps of the patients’ journey through the healthcare system have been designed and have proven to be effective in reducing the extent of this problem. Therefore, the challenge in practical terms results in selecting the right interventions, their adoption, and scaling-up.

Moreover, the time is ripe to adopt the novel approach of an increased patient role in the treatment decision-making process. Under this approach patients cease being inactive figures subject to accepting impositions in their treatment – as commonly accepted under the old-fashioned paternalistic model of doctor-patient interaction – and become increasingly free to take part in their health decisions. Indeed, with increased health literacy and ICT support, they become co-producers of better health outcomes.
3. **Action Group Description**

### 3.1 Role and Objectives

In agreement with the overall goals and triple win defined in the Strategic Implementation Plan\(^1\) (SIP) of the EIP on AHA, the A1 Action Group aims to contribute to the improvement of adherence to medical plans and medication at European level under the pillar on "Prevention, screening and early diagnosis".

In particular, the implementation plan called for a set of actions to be launched, namely, delivering a prescription and adherence action at regional level as well as developing innovative tools and applications to promote health literacy and patient empowerment for informed lifestyle choices. These actions would contribute to the overall aim of the Action Group to improve the quality of life and health outcomes of older people living with chronic conditions in at least 30 EU regions, through a holistic approach, including enhanced self-care, personalised care, better adequacy of treatment and increased adherence to safe and effective care plans.

### 3.2 Governance & Coordination

The European Commission provides general strategic and project management support to Action Group A1; monitoring and showcasing of the partners’ achievements; overall coordination of the work conducted; organisation of meetings and conferences and communications activities.

Three coordinators were appointed for Action Group A1 and are responsible for defining the main line to take for the group together with the European Commission; disseminating A1 achievements in events and conferences and coordinating work under three collaborative work areas. Each areas is in turn composed of several projects, coordinated by project coordinators, who monitor the good implementation of the activities and report back to the collaborative work coordinator.

Finally, all A1 partners are responsible for the implementation of their own individual commitments and the delivery of results in the collaborative work activities they participate into. The governance structure for the period 2012-2014 is presented in the Figure 3.

![Figure 1. Governance Structure of the Action Group A1](image)

### 3.3 Structure

In response to the SIP, the European Commission launched two invitations for commitments, in 2012 and 2013, inviting stakeholders to contribute to the implementation of its objectives.

Through this process, the A1 Action Group brought together 62 'main' partners

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coming from 10 EU Member States\(^2\) and representing 68 multi-stakeholder commitments from 31 different countries.

### 3.4 Action Areas of the AG

Five broad domain areas have been identified to address the challenges and respond to the objectives of the Action Plan. These areas represent the collective interests and shared vision of A1 Action Group partners, namely:

- Adherence to care plans
- Empowerment of patients and caregivers
- Improvements of the health care services
- Research and methodology
- Communication

In addition, three collaborative work areas have been established, in line with the above mentioned action areas:

- Adherence to care plans and Research (coordinated by Alessando Monaco, AIFA, Italy)
- User/patient empowerment (coordinated by Giuseppe Fico, LST Madrid, Spain)
- Improvements of the healthcare system with a focus on polypharmacy and innovative pharmaceutical care (coordinated by Alpana Mair, NHS Scotland, UK)

#### 3.4.1 Adherence to care plans

Poor adherence is a substantial roadblock to achieving better outcomes for older patients, especially when their treatment regimens are complex. Managing medications is complex, particularly for consumers with multiple chronic diseases, also known as multimorbidity. Strategies and initiatives in this area aim to improve patient adherence focusing on product innovation and the use of Information and Communications Technologies (ICT).

#### 3.4.2 Empowerment of patients and caregivers

Lack of motivation and difficulties to adopt and maintain behavioural changes are among the main barriers to adherence reported in literature. Indeed, considering the low availability of patient-oriented information, designing services that support patients in self-management – especially for long-term therapies – is a promising strategy. Actions in this area focus on empowering patients providing them with all the instruments they need to achieve acceptable levels of treatment compliance. They concentrate on education, knowledge and awareness; support and motivation and on interventions aimed at healthcare professionals.

#### 3.4.3 Improvements of the health care services

Pharmacological treatment for older adults often involves multiple prescriptions for multiple chronic diseases, which represents a challenge for the prescribing physician. Indeed, evidence-based, disease-specific guidelines rarely provide recommendations for multimorbid older patients, which makes their application to this group of patients not straightforward. In order to deliver improvements in the healthcare system which ultimately improve disease control and decrease the demand of services (e.g. hospitalisations, length of hospital stay), this area focuses

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\(^2\) Belgium, Germany, Ireland, Poland, Portugal, Spain, Sweden, the Netherlands and the United Kingdom

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on interventions to improve prescription appropriateness; monitor adherence; reinforce cooperation and enhance communication among healthcare professionals, and promote the use of ICT tools to support both healthcare professionals and patients.

3.4.4 Research and methodology

In order to implement successful interventions that ultimately result in an increase of adherence rates, a sound evidence base is needed. For this reason, this action area aims to fill the knowledge gaps in particular on research and methodology on ageing and adherence (epidemiological data, risk stratification); health technology assessment and cost-effectiveness analyses of interventions and the use of databases on prescriptions and health outcomes to evaluate the rational use of medication.

3.4.5 Communication

Fostering communication between different partners in the healing and caring process to improve adherence is essential. This action area focuses on collecting partners’ practices and showcasing successful experiences.
4. Activities & Achievements

4.1 General Results

Over the last four years, partners of the Action Group on Prescription and Adherence to Medical Plans have collaborated and shared evidence, innovative solutions and insights on effective approaches to tackle poor adherence in order to improve the quality of life and health outcomes of older people living with chronic conditions.

The work undertaken by the group has served a two-fold objective. Firstly, adherence has become a priority in the policy agenda and highlighted as a priority in EU funding schemes (e.g. IMI2 Strategic Research Agenda, Health Programme). Secondly, collaborative dynamics established in the working group have led to the identification of key topics such as the importance of prescription appropriateness – especially in patients with several chronic conditions, also known as multimorbidity; adherence measurement and monitoring; the better use of pharmacists and nurses to implement adherence support services and patient empowerment and engagement.

In particular, following the Action Areas devised, the Action Group has achieved the following results:

- Improve patient adherence to care plans

In order to increase adherence rates in polymedicated patients, partners have put forward innovative approaches tailored to the patients’ needs. These patient-centred solutions range from modernisations in packaging, like the Personalised Dosage Systems (PDS), to the use of ICT solutions such as electronic devices and alerting systems for patients.

- Empower patients and care givers

Improving adherence is also about understanding one’s disease and being involved in the decision-making process to achieve the best possible outcomes. Interventions targeting improved quality of life and overall management of diseases have been developed and shared by partners, especially health literacy tools for a wide range of chronic diseases or patients with multimorbidity, and lifestyle intervention tools. A strong interest has also been devoted to healthcare professionals for whom training programmes and adherence management programmes have been designed. An open channel of communication between patients and healthcare professionals has also been envisaged through the establishment of web-based social networks.

- Deliver improvements in the healthcare system

In his journey through the healthcare system, the patient will interact with a full range of healthcare professionals, a holistic approach is therefore necessary to increase adherence by acting on all possible parameters on the way. Partners have in particular concentrated on interventions tackling prescription appropriateness, medication review and reconciliation protocols which in particular reduce the number of adverse drug events, especially in multimorbid patients. Attention has also been brought to the importance of electronic prescription, electronic health records and monitoring/reporting tools that not only improve healthcare professionals’ collaboration but also enable to measure the effectiveness of such interventions.
Contribute to research and methodology

The application of evidence-based, disease-specific treatment guidelines to complex elderly subjects is not straightforward, as they are usually not tailored to these patients, and only rarely take care of comorbidities. To contribute to the evidence base, partners have conducted work together on monitoring adherence through observational studies and improving adherence through intervention studies through the identification of tools, collection of databases and production of indicators.

4.2 Achievements

4.2.1 Collaborative Work

Based on their knowledge, experiences and current challenges in tackling adherence, partners prioritised several topics to be treated in a collaborative manner and established closer collaboration. The main results of the work conducted are described below.

4.2.1.1 Adherence to care plans and Research

Under this topic, Action Group partners identified two priority issues, first the identification of tools to monitor adherence and second, the identification of tools to improve adherence.

Monitoring adherence through observational studies

Within this priority, an extensive review of adherence indicators was performed through a systematic literature review which revealed that no gold standard had been defined in adherence measurement in older people and that triangulation methods appear to be the most suitable method for medication adherence assessment. In order to establish a standard of adherence measurement, a set of indicators was agreed through a Delphi exercise among partners. This set of indicators was used to assess the real world prevalence of non-adherence in clinical databases provided by the network of collaborating parties. Along with this exercise, the clinical outcomes, such as hospitalisations, mortality, use of resources, quality of life and independence were analysed. Literature and data-base sets of indicators to assess polypharmacy and adherence in the older population were finally revised. Only those showing a clear association with clinical outcomes were included in the final set of indicators, and divulged through peer-reviewed publications. 3,4

Improving adherence through intervention studies

Under this priority, a systematic literature review in order to identify available tools to improve adherence in intervention studies was performed. An assessment of the effects of different interventions aimed at improving adherence in older adults over predefined clinical outcomes (such as hospitalisations, mortality, use of resources, quality of life and independence) allowed the identification of the most successful interventions. On those grounds, a final set of tools able to improve adherence in the older population was defined.

4 “Scaling up health knowledge at European level requires sharing integrated data”. Submitted to Clinic economics and outcomes research journal
5 “Interventional tools to improve medication adherence: review of literature”. Patient Preference and Adherence 2015:9 1–12

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4.2.1.2 User/patient empowerment

Adherence behaviour is influenced by a wide array of factors, such as social/economic, condition-related, therapy-related, patient-related, and healthcare system-related ones. Therefore, relevant actions should focus on empowering the patients and providing them with all the instruments they need to achieve acceptable levels of treatment compliance.

These include:

- Raising education, knowledge and awareness;
- Enhancing the capability of accessing healthcare services and resources;
- Providing motivation and support during treatment and
- Defining treatment as a combination of multiple sub-prescriptions.

In consequence, the A1 Action Group performed the following set of activities, described also in peer-reviewed publications.

6 "Analytic Hierarchy Process for Determining the Most Important Factors to Empower Elderly People in Taking an Active Role in Their Health: Study Design. In Ambient Assisted Living and Daily Activities". (pp. 390-393). Springer International Publishing.

7 "Analytic hierarchy process to define the most important factors and related technologies for empowering elderly people in taking an active role in their health". Journal of medical systems, 2015, 39(9): 1-7.

A mapping of programmes of palliative care and advance care directive initiatives among partners was carried out. As a result evidence from numerous European countries was collected and compiled showing the heterogeneity in palliative care interventions. In Spain for instance, two levels of provision exist – low and high dependency – and institutional care is a long-term care service provided in residential centres adapted to the type of dependency, degree of dependency and the intensity of care required by the dependent person. In Portugal, the Programme for the Elderly in Nursing Homes was launched in 1997 with the objectives of reinforcing and stimulating the services offered by institutional care (nursing homes), especially in less well equipped areas, and of improving the quality of those already existing. In Northern Ireland some homes offer full-time nursing care, others support people with a specific disability or medical need. In Finland Sheltered Housing with 24 hour care and full called Residential Homes exist. In Ireland both public and private retirement villages and convalescent homes have long term facilities. All-day current practices of pharmaceutical care services for patient empowerment in different European countries, considering a number of relevant factors, such as which stakeholders are involved, which population groups were involved, which tools are being used to perform activities and which barriers are limiting the deployment of these services.

Evidence from different countries was collected about type of services offered by pharmacies; barriers limiting the deployment of these services; as well as the evidence in support of policy developments toward more active role of community pharmacists in patient empowerment and helping public health in an active way.

- Exchange of good practices on innovative programmes for palliative care in nursery homes

An emerging consensus among academics, professional organisations and policymakers is that community pharmacists should contribute to the safe, effective, and efficient use of drugs. Nevertheless, the role of pharmacists is still under-employed in some European countries. The goal of the survey conducted under this activity was to assess
care is provided in nursing homes by nurses and care staff. These findings are vital to draw comparisons between similar/dissimilar care settings, as the term nursing home may have different meanings in different countries.

- Definition of the most important aspects of user empowerment to be included in clinical practices to improve adherence

A research work to elicit the most important factors to have an `Empowered Patient` who establishes `Productive Interactions` with a `Proactive and Prepared Care Team` (as defined in the Chronic Care Model) was conducted. Partners defined 2 trees of needs and also prioritised the needs for each tree:

- Patient Activation: 12 needs, organised in four meaningful categories (belief; being confident and informed; being proactive and maintaining lifestyle changes) were identified. Under this tree, the role that the patient has in the management of the disease(s) seems to be secondary to the information to be delivered. The tree could be used by healthcare professionals during visits as a tool to quickly assess patient empowerment, and improve patient-provider interaction.

- Proactive and Prepared Team: the tree consists of 13 needs organised in four categories (data review; intervention; solving problems for improving self-management and follow-up). For this tree, involving the patient, therapeutic alliance and coaching seem to be the most urgent changes to be implemented by healthcare systems.

4.2.1.3 Improvements of the healthcare system with a focus on polypharmacy and innovative pharmaceutical care

This collaboration focused on designing coherent national programmes addressing polypharmacy and adherence, and sharing innovative models to deliver pharmaceutical care. It had 4 subtasks:

- Review of polypharmacy review programmes and sharing best practice tools and outcomes with European partners

Identified tools from EU countries were analysed and benchmarked. On those grounds, NHS Scotland recently revised its tool to produce a 2015 guidance on polypharmacy management, which has been shared across the A1 and B3 Action Groups. Key areas that need to be considered include the process and barriers that also need to be addressed before these interventions can be scaled up.

- Literature review and creation of a repository looking at tools to improve prescription

Collaborating partners selected nine guidelines from the UK, Spain and the USA, which review the medication process with a specific methodology. Based on the revision of the guidelines, recommendations were established on specific information, which may be useful in order to elaborate a medication review guideline (e.g. patient involvement, special considerations in older people, etc.).

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• Progress indicators and ways to target patients for review and development of indicators

Progress indicators and ways to target patients were discussed in order to undertake reviews. Discussions included high-risk medications, number of medications people were taking and also frailty of patients that would identify progress and improvements made (e.g., the number of patients on antipsychotic medications that have had their medications reviewed and reduced as a result).

• Sharing the most effective clinical pharmacy services affecting review of medicines and adherence

Examples from across partners on the most effective clinical pharmacy services were collected providing insight on different models to implement sustainable delivery of polypharmacy and adherence. Based on the collected models, partners were able to discuss the most effective aspects for an ideal model.

As a result of the above-mentioned work, many of the partners worked together to discuss possible ideas for further collaboration and used this learning to build on a submission for a Health Program call which was successful in receiving funding. Thus, a follow-up of this collaboration is the SIMPATHY Project (Stimulating Innovation in the management of Polypharmacy and adherence in the elderly), aiming to tackle the challenges associated with growing levels of polypharmacy and multimorbidity by promoting and supporting organisational change and alignment of mission, goals, policies, structures, technologies and cultures to facilitate healthcare innovation across the EU. The project started in June 2015 and has been built on the successful collaboration from A1 partners but also drawn in some members from B3 and A2.

4.2.1.4 Key messages and learnings from the collaborative work

• Medication adherence and persistence is universally recognised as one of the major clinical issues in the management of chronic diseases.

• Non-adherence to medical plans is a public health problem at every level of the population, but particularly in older adults due to the high number of comorbidities and the consequent polypharmacy. The increased rates of polypharmacy are a critical problem in chronic patients.

• In the last few decades, the rates of non-adherence have remained unchanged.

• There is no gold standard in adherence measurement; no single method is sufficiently reliable and accurate. Thus, triangulation of multiple methods appears to be the most suitable approach.

• It is increasingly evident that adherence, as a process, has to be assessed over the time, and not just at one evaluation time point.

• Most of the known interventions effective in improving adherence are not associated with significant improvements in clinical outcomes such as biomarkers, morbidity, mortality, quality of care, quality of life, patient satisfaction, health care utilisation and costs.

• Pragmatic clinical trials to validate adherence measures and adherence targeting interventions in older patients are needed.

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It is essential to ensure an optimal medication plan before implementing interventions to improve medication adherence.

**Sustainable innovation** in polypharmacy review and delivery of pharmaceutical care can be achieved by multidisciplinary work with pharmacists as part of the healthcare team with evidence to support positive outcomes for the patients.

**Patient empowerment** is an effective approach in elevating the rates of adherence to medication plans. Patient education to understand the key messages to improve their medication use is also relevant.

**Medication review/conciliation** contributes to improve the inadequate polypharmacy and optimise the medication needed for patients. The process requires a strategic organisation in the health team to guarantee the coordination and time to implement the required methodology.

If guidance is developed it should be adopted by all health professionals across primary and secondary care and delivered by a multidisciplinary team. Continuing education for physicians and pharmacists involved in the process may be needed.

Working in a collaborative approach is highly beneficial for the Action Group and has resulted in clear benefits. Many fields for cross-group collaboration have been identified and will be included in the next activities of EIP on AHA under renovated Action Plans.

### 4.2.2 Individual Commitments

At individual level, partners have worked towards the implementation of their commitments submitted in the first and second invitations for commitments.

At the end of 2015, around 36% of the planned commitments have been achieved, whereas 31% are still in progress. These commitments cover the 4 collaborative areas of the Action Plan, and have produced tangible deliverables such as scientific articles, toolkits or protocols, websites or Apps etc.

![Figure 2. Achievements: deliverables planned vs completed](image)

Further details on the description and outcomes of these commitments are presented in the annexes.

### 4.3 Key messages and lessons learned

Over the period 2012-2015, the A1 Action Group has proven to be an effective forum for the exchange of best practices, a successful platform for collaboration, as well as the advocate for a new vision on the importance of patient adherence across Europe. The work undertaken by the group has been showcased in international conferences and events highlighting adherence as a priority topic in the public health agenda. It has also provided a
springboard for European initiatives on polypharmacy and multimorbidity.

Collaborative dynamics established in the Action Group have led to the identification of key topics such as the importance of prescription appropriateness – especially in patients with multimorbidity; adherence measurement and monitoring; better inclusion of pharmacists and nurses; multi-professional healthcare teams dedicated to implement adherence support services and patient empowerment and engagement.

Moreover, partners have designed, implemented and tested several successful initiatives at local, regional or national level. Most of these initiatives tackled practical issues related to patient adherence along the entire treatment process: from appropriate prescription, to adherence monitoring and patient empowerment initiatives. Initiatives with successful outcomes become therefore model practices with a potential to be adapted in other regions by other European stakeholders.

Through this process, the work conducted and intelligence sharing has led to significant results and lessons learned:

- There is a common interest in improving adherence in European older people and raising awareness on the importance of the topic, a great number of diverse stakeholders are looking for effective interventions to target and solve this problem. Joining forces seems to be the advisable approach, as there is unfortunately no ‘silver bullet’ available – no single intervention is able to completely solve this puzzle.

- Maintaining the effect observed in pilot projects and scaling up such initiatives are definitely the challenges that future work should focus on.

- In order to increase the scaling-up potential, there is a need to adopt easy-to-assess objective measurable outcome indicators from the very beginning of the intervention.

- Collaboration among partners has led to the identification of additional topics of interest for further cooperation such as strengthening the role of the pharmacist in adherence interventions and reflecting on ways to work towards patient health integrated information.

- There is a need to disseminate the results of the collaborative work in order to maximise its impact.

- Cross-Action group topics of interest have been identified, such as multimorbidity. These topics may serve better collaboration between AGs under synergies.
5. Conclusions and Future Activities

The collaboration among European stakeholders active in the field of adherence and prescription to medical plans – initiated and facilitated under the umbrella of EIP on AHA – has managed to obtain significant results within a short period of time. On the one hand, multiple practical problems of older patients have been addressed at local, regional and national level resulting in an increase of adherence rates in real life conditions. On the other hand, an even more ambitious goal has been reached by putting adherence at the centre of European discussions and making it one of the priorities for the ageing population in Europe.

The A1 Action Group has played a very important role in this process. Being first of its kind in gathering diverse stakeholders coming from academia, industry, local and central governing institutions, payers, etc., it has proven to be a unique forum for the exchange and benchmarking of good practices providing its members, as well as other Action Groups members, with the opportunity to learn and benefit from a wide range of modern and effective interventions designed to increase adherence rates. There is indeed an underlying “multiple-win” behind better adherence: along with better health outcomes for patients, come benefits for healthcare providers, industrial partners and societies.

Encouraged by these achievements within the first period of activities, partners are looking towards a new period setting even more ambitious aims for the future. In particular, further cooperation and development is expected in the following areas and will constitute the core of the renovated Action Plan:

**Better collaboration among health professionals for the benefit of patient adherence.** There is an urgent need for better coordination among healthcare professionals at different levels to increase patient adherence. In particular, initiatives aiming to reinforce the role of pharmacists in the integrated care process and adherence management have been proven to be effective and require further attention. To obtain this goal, new evidence-based models of organisation seeking to reorganise the responsibilities among healthcare professionals need to be developed and tested across European healthcare systems. In addition, education and pre- & postgraduate training to healthcare professionals has to be adapted in order to equip healthcare professionals with the knowledge and skills necessary to manage adherence in multi-disciplinary teams.

**Patient empowerment.** A more involved patient in the decision-making process of his/her treatment is a more responsible patient, with increased self-management and better outcomes. Health literacy initiatives conducted under the previous Action Plan and a large number of local initiatives in this field have proven to be successful. In addition, the enormous boost of ICT technologies provides with new opportunities every day, creating an enabling environment for further involvement, and empowerment of elderly patients. Along the use of these new technologies, several questions arise. The issues of data privacy, authorisation of

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guidance or legal responsibility are just few examples of many that need to be addressed. On the other hand, this trend is irreversible and the only question is how to prepare European healthcare systems for the effective absorption of this new resource.

**Better integration of activities undertaken within, and across the Action Groups.** With a long list of achievements from the first period of activities, the A1 Action Group is now ready to tighten the collaboration among stakeholders in order to speed up the process of harmonisation and even increase the productivity of the Group. Different tools are envisaged for this process, with ultimate aim of scaling good practices and improving adherence to medical plans in the entire European Union.

These and the other fields of activity will be further detailed in renovated Action Plans that the members of the A1 Action Group are currently designing for the period 2016-2018.
6. Annexes

6.1 Annex 1: Outcomes of AG A1 individual commitments

**Improve patients’ adherence to care plans: patient centered solutions**

**Electronic Devices and alerting systems for patients**

**ADHIÉRETE Programme**

**Organisations:** General Pharmaceutical Council of Spain (Consejo General de Colegios Oficiales de Farmacéuticos de España)

**Location:** Spain

**Description:** ADHIÉRETE is a programme (naturalistic, randomised, prospective, with no control and multicentre study) to evaluate adherence to treatment in elderly (> 60 years), chronic, polymedicated (5 or more medicines) and non-adherent patients, through the use of pharmaceutical services, Personalized Dosage Systems (PDS) and/or ICT (mobile device applications).

The study benefited from the collaboration with Laboratorios Esteve, Fundación Vodafone España and Anota. Deliverables were:

1. ICT tool (pharmacist’s platform) for community pharmacies to create patient records, collect data and send remote warnings to patients.
2. App for mobile devices to help older patients to adhere to medication.
3. Personalised Dosage Systems (PSD)
4. Training programmes: training sessions for pharmacists prior the beginning of the study including Pharmaceutical Care procedures and ICT tools used.
5. Programme protocol development.
7. Final report.

**Outcomes:** Participation of 51 community pharmacies, 116 community pharmacists and investigators from Badajoz, Barcelona, Bizkaia and Cáceres. In all, 174 patients were recruited and the analyses include a valid sample of 114. Patients were randomised in three different groups: PDS; PDS + Mobile App and Mobile App (confirmation of medication uptake and warning messages sent by pharmacist).

- 56.1% using 5-8 medicines; 34.2% using 9-12 medicines.
- Adherence (Morisky-Green): 35%-75.7% (Visit 3-Final Visit).
- Adherence (medicine uptake): 62.1%-89.2% (Visit 3-Final Visit).
- Quality of Life (EuroQoL 5D): 0.078 points (Visit 1-Final Visit).
- Patient Satisfaction: 81.28 (0-100).

For the App Group, adherence, quality of life and satisfaction results, though...
improving, are lower than in the other groups. The pharmacist’s intervention seems to be effective for the improvement of adherence, regardless of the supporting tool used. Adherence improvement can be linked to an improved quality of life.

**Deliverables:**
- Guidelines: Materials for training sessions – 1
- Guidelines: Materials for training sessions – 2
- Guidelines: Programme’s Protocol
- Report of the Results ADHIÉRETE
- Infographic of ADHIÉRETE

**Compliance 3D for asthma patients**

**Organisations:** Medical University Warsaw, Medspire sp.z.o.o.

**Location:** Poland

**Description:** The aim of the project was to create a modern remote monitoring system which measures older patient’s adherence to medication and helps in the supervision of therapy. The C3D solution is a device (sensor) that monitors complex medication adherence, as well as system management software. The device does not only allow registering particular events, but is also equipped with a mechanism that reminds patients to take their next dose (and also indicates that the drug has already been taken - a problem in patients with dementia). The supervisor will be able to check whether the drugs were taken and quickly intervene if they have not been taken. The IT system also allows the doctor to have an overview of the information during the course of therapy and to evaluate its compliance with the given recommendations.

**Outcomes:** The project set up a new multidisciplinary research team (doctors, nurses, public health and IT specialists) aiming to achieve significant technology development to support and monitor treatment of patients with respiratory diseases. The team has created a prototype of the monitor-motivate device and software for patients with pulmonary diseases (Asthma, COPD). During the project the team conducted a survey on a sample of 1,728 people on the willingness to use the telemonitoring-motivation device. The results showed that people with low income express the highest willingness to use telemonitoring-motivation electronic devices. Therefore, further studies are focused on device price reduction to increase patients’ access to the technology.

**Deliverables:**
- Video: Compliance 3D for Asthma Patients (C3D Solution)
- Development of senioral policy in Poland - analysis

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8 https://webgate.ec.europa.eu/eipaha/library/index/show/id/993
9 https://webgate.ec.europa.eu/eipaha/library/index/show/id/994
10 https://webgate.ec.europa.eu/eipaha/library/index/show/id/995
11 https://webgate.ec.europa.eu/eipaha/library/index/show/id/990
12 https://webgate.ec.europa.eu/eipaha/library/index/show/id/991

13 https://www.youtube.com/watch?v=wMp63CC2fy4&feature=youtu.be

November 2015
Empower patients and caregivers

Training programmes and interventions for HCP on adherence management

Health Education Programme targeting the Elderly on the Correct Use of Medicines (PESGG)

Organisations: Catalan Health Service (CatSalut)

Location: Catalonia

Description: The Health Education Programme for the Elderly on the correct use of medicines (PESGG) is a project consisting of talks given by community pharmacists to foster the proper use of medicines by older patients, since polypharmacy is common among them and therefore they are a priority group.

The teaching materials consisted on two complementary sessions, designed to be given sequentially. The first session “Proper use of medicines” is the conceptual framework, while the second session “Importance of following treatments well” is more participative.

The programme’s efficacy was measured by a survey on the acquisition of knowledge on medicines among the older patients that attended the talks.

The survey is structured in blocks and divided in two sides: side A is answered before the workshop and side B is filled afterwards. The block of knowledge on the proper use of medicines is repeated in both sides aiming to determine the degree of knowledge assimilation.

Outcomes: 272 workshops were conducted with an estimated assistance of 5,200 persons. In total, 2,927 questionnaires were analysed, 1,750 corresponding to the first session (141 talks) and 1,177 to the second session surveys (100 workshops).

The assistants’ average age was 73 years-old, 76-78% were women and 58-60% had received primary education. The satisfaction degree was high (4.4 out of 5).

Results reflect proper habits and adequate level of knowledge prior to workshops. It is important to highlight that the assistants perceived doctors and pharmacists as their reference sources for medicine related issues.

All items evaluated in the knowledge block on the proper use of medicines were statistical significant (p<0.001). The association force, measured by the Cramer’s V, was stronger in items related to frequent misconceptions in medicines (e.g. generic/branded medicines, higher price denotes more quality, overdosing), meaning that those items had a poorer degree of knowledge before the workshop that highly improved afterwards.

Deliverables:
- Teaching material “The good use of medicines”\(^{15}\)
- Teaching material “Importance of following well treatments”\(^{16}\)
- Programme presentation and final results\(^{17}\)
- Interview in the EIP-on-AHA Newsletter issued in March 2015\(^{18}\)

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\(^{15}\) https://webgate.ec.europa.eu/eipaha/library/index/show/id/909

\(^{16}\) https://webgate.ec.europa.eu/eipaha/library/index/show/id/910

\(^{17}\) https://webgate.ec.europa.eu/eipaha/library/index/show/id/992

\(^{18}\) https://webgate.ec.europa.eu/eipaha/library/index/show/id/916

November 2015
Lifestyle interventions to improve quality of life and management of disease

Active and Healthy Ageing Coalition

Organisations: Consejería de Sanidad y Política Social, Región de Murcia.

Location: Spain

Description: Our Coalition has enhanced links between several partners such as patient and consumer associations, Public Health administration, academia, the research community and the business sector. We share the vision of a society with improved quality of life and longevity for its chronic patients, older people and their caregivers. Our mission has been to develop, implement and evaluate several local experiences in which available resources – public and private – have been mobilised to achieve better quality of life and longevity. We have worked, both in Action Group A1 (Adherence) and B3 (Integration) in order to develop and implement: a) a set of educational activities to improve the autonomy of patients and their caregivers; b) ICT platforms that facilitate the communication between patients/caregivers and health care providers; and c) integration between hospital records, the primary care and social workers ensuring better delivery with safety and convenience for the patients/caregivers.

Outcomes: The EIP on AHA Coalition in the Region of Murcia (Spain) began to work in 2013, when its Health Administration had already advanced in the regional deployment of clinical electronic records and the implementation of electronic prescription. Currently both processes are completed with huge impact among professionals, citizens, administrations and ICT companies. Because the Murcia’s Health Administration is the leader of our Coalition, we consider these results as a shared success. Progress has been made in communication between partners through a web platform recently introduced. In order to have a better adherence to both pharmacological and lifestyle treatments, the educational needs of professionals, citizens and patients have been evaluated. Finally, it has proven the effectiveness of an educational intervention aimed at older patients with DM2, working in interactive groups, with a significant decrease in HbA1c%, which indicates that the model can be suitable for most chronic health problems.

Deliverables:

- Electronic health records & patient’s access to their personal medical information via “Agora Ciudadano”
- Collaborative digital platform between healthcare professionals or between HCP and patients via “Consulta correo”
- Professional and Citizen’s Electronic prescriptions via Centre for Information and Evaluation of Medicinal Products and Medical Devices
- Web based informative & social network
- Review of the literature about educational needs across all participants in our Coalition

19 https://sede.carm.es/sms/agoraciudadano/
21 http://www.murciasalud.es/pagina.php?id=112094&idsec=1083&expand=1
22 http://blogs.murciasalud.es/coalicion-envejecimiento-murcia/pagina-ejemplo/region-de-murcia/

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including an assessment of health literacy in the elderly population[^23].

- Publication “Lifestyle intervention to improve quality of life and management of disease: a case on DM2”[^24].

### Happy Walks Program

**Organisations:** Healthy Lifestyle Institute C.U.R.I.A.MO, University of Perugia

**Location:** Italy

**Description:** The Happy Walks Program is a model to motivate middle-aged and older people with/without chronic diseases to adopt healthy lifestyles and improve physical performance in order to participate in organised outdoors activities. The model aims to increase patients’ physical performance, cardiorespiratory fitness, muscle strength and perceived quality of life.

The Happy Walks Model is organised in a 4 month intensive phase (which includes medical examination, nutritional counselling, individualised exercise programme, psychological counselling and therapeutic patient education in groups) and a long-term adherence support to lifestyle changes (outside trekking activities, group psychotherapy and training for difficult tasks, including a control every 3 months for the first year and yearly controls thereafter).

**Outcomes:** The results have been statistically significant reductions in body weight, fat mass and waist; decreases in blood pressure, both systolic and diastolic and 10% reduction in the use of medication for diabetes and hypertension. The Treadmill test (50% of heart rate reserve) showed a significant increase of speed and a decrease of blood lactate. The Rockport Fitness test confirmed the increase of VO2max both in females and males. The results in muscle strength showed an average improvement ranging between 48-75%.

The most significant results have been the improvement in perceived quality of life (SF36) and the decrease of depressive symptomatology leading to better quality of life and mood.

Additional outcomes have been the implementation of more sustainable tourism and outdoor activities in Italy where the model has been deployed.

Future possibilities are to test feasibility and reproducibility of the model in other European Countries and create a network of ‘healthy trails’ in Europe.

**Deliverables:**

- [Happy Walks (video)](https://www.youtube.com/watch?v=33Rv0497Jng)
- Scientific article “The Impact of Strenuous Group Physical Activity on Mood States, Personal Views, Body Composition, and Markers of Myocardial Damage in Overweight/Obese Adults: The “Step-by-Step Italy’s Coast to Coast” Trek”[^26]
- Scientific article: “Multidisciplinary lifestyle intervention in the obese: Its impact on patients’ perception of the disease, food and physical exercise”[^27]

[^26]: http://www.hindawi.com/journals/bmri/2014/854129/

November 2015
Web-based social networks

QUELYPHARM - Qualification of polypharmacy geriatric with optimisation of the use of drugs and diagnostic tests

Organisations: DSTF Department of Drug Science and Technology, University of Turin

Location: Italy

Description: Polypharmacy can have a profound impact on the onset of frailty conditions and of geriatric syndrome in +65 populations. Analyses of adverse drug reactions in older people's polypharmacy is currently inadequate and new tools are essential in a perspective of optimisation of medication therapies, aimed to assess the potential impairment of perceived quality of life and age-related disability. The complexity of the problem opens different possible approaches for which we considered the following key goals: a) information and involvement of patients with a target of empowerment and b) education of health professionals involved in caring for older people (GPs, pharmacists, nurses, etc.) either at a pre-graduation or at a post-graduation step.

Outcomes: Locally, interest in our project enabled QUELYPHARM partners to tighten multidisciplinary proactive collaborations with public (Piedmont Health Department, Local Health Units) and private sector (SMEs) referents, which ended up in project proposals submitted to the European Commission (OPTIMIZE, ISMIR, CHOOSE, SUNFRAIL).

The QUELYPHARM project involved many Pharmacy students who participated in the Commitment activities of data collection, processing and set up of the websites. These activities, part of the tasks for the development of experimental theses, helped to identify new aspects on the professional role of the pharmacist in the social-health area.

Deliverables:
- Website to inform 65+ citizens and health professionals on the correct use of medicines
- QUELYPHARM website

Information and counselling campaigns

Citizen and patient reporting tool for adverse drug reactions and other medication-related problems

Organisations: Universidad de Oviedo - Departamento de Medicina, Grupo Asturiano de Investigación en Farmacoepidemiología

Location: Spain

Description: This health plan undertakes a direct reporting tool of problems related to medications open to citizens. Under the slogan “yo notifico” (I report), the project has developed: 1) a website (www.yonotifico.es) and 2) a paper form: "the blue card" for citizens to report medication-related problems. The electronic form includes a free-text field to allow citizens to summarize the case in their own terms. The website also includes guidelines on how, what and when to report. Simultaneously, we ran a promotional campaign of the project in local media and published a newsletter aimed at citizens and linked it to the “yo notifico” website.

Furthermore, a survey aimed at citizens was carried out during 2014 in Asturias (Northern Spain) to ascertain public opinion on medication information aimed at citizens

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28 http://www.farmanziani.unito.it/
29 http://www.quelypharm.unito.it/
enclosed in the package leaflet information and public perception of some safety aspects of medicines.

**Outcomes:** According to our initial experience, the main difficulty in developing spontaneous reporting tools for citizens is not their ability to identify problems related to medications, but also: 1) to inform the population about the possibility of collaboration by reporting medication-related problems and 2) to be able to involve citizens in active reporting. During our promotional campaign, we observed that citizens where interested in collaborating but also surprised of this possibility. Most of the citizens that suffered an adverse drug reaction claimed to report it to their doctor. Prescribed medicines were perceived as safer than non-prescribed medicines. Specifically women claimed to read the information on the package leaflet more often than men and also recognised a greater difficulty in understanding it. Although the understanding of the patient information leaflet is directly related with educational level, a high percentage of interviewees with higher or secondary education claimed to occasionally having had some understanding difficulties.

**Deliverables:**

- [Yonotifico-website](https://www.yonotifico.es/index.php/es/)
- [Form to notify problems related to medication](http://www.yonotifico.es/images/difusion/formulario_yonotifico.pdf)
- Scientific paper: “Reporting problems related to medications in Spain. The yonotifico project (1st report), an option for citizens”

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**Deliver improvements in the health care system: Health care system centred solutions**

**Decision support tools for appropriateness of prescription**

**ALISS - Local Information System for Scotland**

**Organisations:** Scottish Government, Health and Social Care Alliance Scotland

**Location:** Scotland, UK

**Description:** Funded by the Scottish Government and delivered by the Health and Social Care Alliance Scotland, ALISS (A Local Information System for Scotland) has been designed with people with long-term conditions and offers an information service, digital tools and asset mapping support to make information about sources of support for health and wellbeing more findable.

A range of support is of value for health and wellbeing: from local activities, events and opportunities to services; historically much of this information has been hidden within communities or spread across multiple websites and directories.

From a series of citizen workshops held across Scotland in 2010 emerged the ALISS blueprint: a service that would gather information into one list (index) and make that list available via the many places where people might look for information, or interact with another person who might help them find it.

**Outcomes:** Between late 2014 and 2015, the programme has focussed predominately on developing partnerships to enable the capture and dissemination of information. This has involved a multi-

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faceted approach, from identifying and indexing existing strategic information sources to working with national channels, communities, services and groups to help them identify and share asset information.

Partners have included NHS boards, GP practices, hospitals, city councils, health and social care partnerships, community planning partnerships, schools, pharmacies, libraries, police, fire and rescue, prisons, housing, third sector organisations and private providers.

Both the number of resources and the number of accounts in ALISS have shown considerable growth between October 2013 and August 2015; with an increase in resources of 60,467, and an increase in accounts of 783.

ALISS was co-produced to ensure people’s needs were met, with an agile approach to offer speed and flexibility, using open source technology to encourage partnership and innovation.

**Deliverable:**
- ALISS website

**Polypharmacy guidance for Scotland**

**Organisations:** Scottish Government and NHS Scotland

**Location:** Scotland, UK

**Description:** As the population ages and people suffer from more multiple conditions, the evidence shows us that they are treated with multiple medicines—polypharmacy. This guidance provides a 7 step framework for all clinicians, regardless of the sector they work in, to undertake a holistic review. This will ensure that there is appropriate polypharmacy and that we optimise outcomes from medicines and minimise harm. It highlights the patients who are most at risk that should be prioritised for review using risk stratification tools. The guidance has been produced by doctors and pharmacists from primary and secondary care, and has case studies to demonstrate application. The guidance also provides economic evaluation and evidence of impact for policy makers and strategic planning decision makers.

**Outcomes:** All health boards across Scotland use the guidance to plan and undertake reviews with evidence to demonstrate benefits to patient outcomes.

All health boards are working to implement sustainable models using teams of pharmacists AND physicians to undertake the reviews.

Drugs with potential to cause harm are being reviewed as a priority as are patients at risk due to frailty.

Reviews have been implemented into national contracts to ensure spread and sustainability.

**Deliverables:**
- Polypharmacy Guidance 2015
- Scientific paper: “Polypharmacy Patterns: Unravelling Systematic Associations between Prescribed Medications”

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33 https://www.aliss.org/

34 http://www.sehd.scot.nhs.uk/publications/DC20150415polypharmacy.pdf
35 https://webgate.ec.europa.eu/eipaha/library/index/show/id/984

November 2015
Comparative efficacy of two interventions to discontinue long-term benzodiazepine use: cluster randomised controlled trial in primary care

Organisations: RedIAPP

Location: Spain

Description: Although benzodiazepines are effective, long-term use is not recommended because of potential adverse effects; the risks of tolerance and dependence; and an increased risk of hip fractures, motor vehicle accidents and memory impairment. The estimated prevalence of long-term benzodiazepine use in the general population is about 2.2 to 2.6%. It is higher in women and increases steadily with age. Interventions performed by General Practitioners (GPs) may help patients to discontinue long-term benzodiazepine use. We have designed a trial to evaluate the effectiveness and safety of two brief general practitioner-provided interventions, based on gradual dose reduction, and will compare the effectiveness of these interventions with that of routine clinical practice.

Method: a multicentre three-arm cluster randomised controlled trial was conducted, with randomisation at general practitioner level (trial registration ISRCTN13024375). A total of 532 patients taking benzodiazepines for at least 6 months participated. After all patients were included, GPs were randomly allocated (1:1:1) to usual care, a structured intervention with follow-up visits (SIF) or a structured intervention with written instructions (SIW). The primary end-point was the last month self-declared benzodiazepine discontinuation confirmed by prescription claims at 12 months.

Outcomes: Although some interventions have been shown to be effective in reducing benzodiazepine consumption by long-term users, the clinical relevance of such interventions is limited by their complexity. This randomised trial will compare the effectiveness and safety of two complex stepped care interventions with that of routine care in a study with sufficient statistical power to detect clinically relevant differences.

Results: at 12 months, 76 of 168 (45%) patients in the SIW group and 86 of 191 (45%) in the SIF group had discontinued benzodiazepine use compared with 26 of 173 (15%) in the control group. After adjusting by cluster, the relative risks for benzodiazepine discontinuation were 3.01 (95% CI 2.03-4.46, P<0.0001) in the SIW and 3.00 (95% CI 2.04-4.40, P<0.0001) in the SIF group. The most frequently reported withdrawal symptoms were insomnia, anxiety and irritability.

Conclusions: both interventions led to significant reductions in long-term benzodiazepine use in patients without severe comorbidity. A structured intervention with a written individualised stepped-dose reduction is less time-consuming and as effective in primary care as a more complex intervention involving follow-up visits.

Deliverables:
- Scientific article: "Comparative efficacy of two interventions to discontinue long-term benzodiazepine use: cluster..."
randomised controlled trial in primary care"36

- Scientific article: “Comparative efficacy of two primary care interventions to assist withdrawal from long term benzodiazepine use: A protocol for a clustered, randomized clinical trials"37

Delivery of Pharmaceutical Care across Scotland: Prescription for Excellence

Organisations: Scottish Government
Location: Scotland, UK
Description: The commitment in Prescription for Excellence is to ensure that all patients have access to pharmaceutical care that is delivered to them by clinical pharmacist independent prescribers to optimise outcomes from medicine preventing harm in partnership with the patients and other health and social care professionals looking after their care.

Outcomes: 10 year plan to improve outcomes for citizens with medicines across Scotland delivered by pharmacists as part of multidisciplinary teams.

Additional training for advanced clinical skills training and independent Prescriber skills commissioned from Medical and Pharmacy Schools – 300 pharmacists signed up.

Health boards provided with initial funding to allow them to employ pharmacists to work in GP practices across Scotland-deployed across all 14 health boards.

Pilot work started in rural communities for pharmacists to deliver support for medicines management by using telehealthcare.

Deliverables:
- Policy Document: 10 year Action Plan38

Collaborative digital platforms between healthcare professionals or between HCP and patients

Fostering prescription and adherence actions at regional level

Organisations: University of Porto, AgeUP-Adhere
Location: Portugal
Description: To contribute to improve patients’ adherence to medication plans, our commitment integrated the development of:

1) Research and education for health programmes to empower patients and caregivers and to improve research and methodology on the issue of ageing;

2) Interactive TV application (iNeighboor TV), also available on PC and mobile devices, allowing presence in the households of senior citizens, to track and monitor the medication prescription and remaining medication of its users; including screen displayed reminders;

3) Development of patient records repositories through a Virtual Care start-up, based on international communication standards (HL7) and futureproof information architectures (openEHR);

4) Development and adaptation of contents and tools for Asthma and chronic

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36 https://webgate.ec.europa.eu/eipaha/library/index/show/id/1005
37 https://webgate.ec.europa.eu/eipaha/library/index/show/id/1004
obstructive pulmonary disease (COPD), aggregated in a web platform (CARAT);
5) Impact assessment of psychosocial and emotional variables effects through the use of ICT (Information and Communication Technologies) among senior citizens in the social context of an online social community and construction of an online community with the participation of senior citizens (SEDUCE).

**Outcomes:** By improving research, developing iNeighbourTV, patient record repositories, the CARAT web platform and the SEDUCE online community, UPORTO’s commitment has contributed to improve patients’ adherence at regional levels.

**Deliverables:**
- List of deliverables for Fostering prescription and adherence actions at regional level

### Multiparametric monitoring and multidimensional adherence to treatment for chronic diseases

**Organisations:** Universidad Politécnica de Madrid, Life Supporting Technologies (on behalf of the METABO and MOSAIC projects)

**Location:** Spain

**Description:** The commitment produced a risk stratification method for type II diabetes patients, pre-diabetic and people at risk of type II diabetes with the objective to a) develop novel methods for risk stratification of type II diabetes patients at risk of developing complications by combining demographic, clinical, life style, air pollution variations, and medication-related risk markers with a specific focus on temporal aspects and other influence factors (e.g. food intake balance, physical activity practice) and b) assign personalised care plans for screening and prevention of type II diabetes, oriented at decreasing the chances of diabetes onset (deliverable 1).

In addition, the commitment developed software programmes for 65+ diabetic patients to achieve specific and measurable lifestyle goals (e.g. losing weight through healthy diet and physical activity, improving health literacy) (deliverable 2).

It also developed lifestyle intervention plans fostering a tight glycaemic control and encouraging the adoption of healthy behaviours through achievement of measurable goals (deliverable 3).

**Outcomes:** The diabetes complications models predict the onset of Retinopathy, Neuropathy or Nephropathy, at 3, 5 and 7 years from the first visit at the hospital. The predictive power results in an Area Under the ROC Curves (AUCs) varying between 0.832 (LR, Retinopathy) and 0.647 (LR, Neuropathy) for a 3 years horizon. Including information related to patients’ behaviour in purchasing medications led to significant results for Nephropathy (AUC for LR at 5 years: 0.684). The prediction of diabetes provides the curve of patients’ risks from 2 to 12 next years. The predictive performance of the model results, in average, in an AUC=0.90, which outperforms the “state of the art” FINDRISC and FRAMINGHAM risk scores (AUC=0.77) (deliverable 1).

In addition, a set of tools have been developed and evaluated in small-scale exploratory study (deliverables 2 and 3).
Deliverables:

- **Scientific paper/deliverable 1**: “Improving Risk-Stratification of Diabetes Complications using Temporal Data Mining” 40
- **Scientific paper/deliverable 1**: On The Correlation Between Geo-Referenced Clinical Data And Remotely Sensed Air Pollution Maps (deliverable 1)41
- **Video/deliverable 1**: MOSAIC-project42
- **Website/deliverable 1**: MOSAIC website43
- **Automatic messaging for improving patients engagement in diabetes management: an exploratory study/deliverable 2)44
- **Integration of Personalized Healthcare Pathways in an ICT platform for Diabetes Management: a small-scale exploratory study/deliverable 345
- **METABO-project (video)**46

**Pharmaceutical Home Care project**

**Organisations**: Muy Ilustre Colegio de Farmacéuticos de Valencia (MICOF)

**Location**: Spain

**Description**: To meet the new challenges faced by the healthcare system, MICOF Valencia is developing a patient-oriented Portfolio of Professional Pharmaceutical Services. This portfolio includes a “Pharmaceutical Home Care project” (AFD in Spanish). Its objectives focus on increasing adherence, promoting the proper use of medicines and decreasing related risks. The AFD project involves the development of tools such as training courses and ICT applications that allow pharmacists to provide pharmaceutical care services, and encompasses:

**Deliverable 1 (completed) - Home Medicine Cabinet Review**: Checking medicine cabinets and other health-related products stored at home by patients and residents. Ensuring patients are aware of the indications and dosage for their own treatment. Indicating inadequate storage, expired products and proper disposal. Preventing the use of common products that could be harmful according to patients’ health status. Providing reports for patients or other health care professionals if necessary.

**Deliverable 2 (ongoing) - Personalised Dosage System (PDS)**: Organising patient’s medication in a personalised blister pack or single-use multicompartment container according to their dosage regimen.

**Deliverable 3 (ongoing) - Medicines Use Review (MUR)**: Structured evaluation of patients’ knowledge and use of their medication.

**Outcomes**: MICOF elaborated a Service Description Document and Standard Operating Procedures (SOP).

To register all the data, process, and to evaluate each intervention, ATENFARMA-MICOF (computer application) was developed. This tool also allows producing written information for patients or submitting reports to other health professionals if necessary.

A Pilot Program was carried out to validate the SOP and check the ICT tool proper functioning.
Results obtained from the Pilot confirmed inconvenient storage, lack of knowledge on medicines use and interaction risks. Spreading the use of this service could increase health literacy, diminish health risks and improve the knowledge and rational use of medicines.

A Training Program was planned for Community Pharmacists at provincial level, to great popular acclaim, consisting of 32 Hours Theoretical and Practical course. 141 Community Pharmacists have been trained at the moment.

**Deliverables:**
- Home Medicin Cabinet Review

**Assessment of effectiveness of interventions**

**GeriatriCS Project: Support to Chronicity and Prescription Adequacy in Nursing Homes for the Elderly**

**Organisations:** Catalan Institute of Health and IDIAP-Institut Universitari d’Investigació en Atenció Primària Jordi Gol.

**Location:** Spain

**Description:**
Background: the GeriatriCS project was originated by the need to improve the care of institutionalised older patients. Similarly to other diseases, these patients and their chronic conditions evolve until the end-of-life. This dynamic process requires an institutionalised chronic patients’ health care reorganisation, both by primary care teams and health providers.

Research question: providing a high-quality, comprehensive care to older people, with guiding patient-centred care would reduce hospital admissions and avoid unnecessary visits to ER (Emergency Room) in institutionalised patients.

Method: GeriatriCS is a population based study with a pre-post intervention, involving 64 GPs, 184 Nursing Homes (NH) and 8,984 institutionalised patients (IP) in the geographical Metropolitan North area, Catalain Institute of Health. The intervention was developed to ensure its consistency and to achieve healthcare objectives determined by proactive healthcare formulae with a reorganisation of the health care of institutionalised chronic patient. The approach is consistent with a quality end-of-life. As primary outcomes the reduction in the number of visits, hospital admissions and visits to ER (per 100 residents) were assessed. The reduction of pharmacy-related yearly cost per resident was considered as a secondary outcome.

**Outcomes:**
- **IP Patients’ profile, 77.3% patients are included in the CRG 6-7 (2 or more chronic conditions); 42.9% have dementia; 28.9% have complex chronic conditions and 6% suffer from advanced chronic diseases.
- The register of the Barthel Test has increased from 3,197 (35.57%) in 2013 to 6,157 (68.5%) in 2014; the average result has not significantly changed, (50.15 to 47.52). The register of the Pfeiffer Test has also increased by 115.3% (2,645 to 5,695), with a current mean of 6.04.
- Adherence to Pharmacotherapeutic guidelines is 77.9%. Prescription of potentially inappropriate medicines has decreased by 4.4%. A total of 51.6% dementia patients have a prescription of one antipsychotic medication.

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47 http://www.redfarmaceutica.com/Atencion/default.cfm?str_action=mostrarAtencion&int_idAtencion=281&int_idSection=2622&CVID=20181383&CFTOKEN=41018121

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In relation to use of health resources with the proactive intervention of the primary care teams, the use of external health resources has decreased by 26.9% in the case of hospital admissions and by 16.1% in the case of attendance to A&E; the use of internal health resources has increased by 20.4% in the case of use of primary care emergency services. The cost per resident has decreased by 18.1% since 2012.

In conclusion, the intervention conducted by a multidisciplinary skilled team with the elaboration of a patient-centred therapeutic plan provides an effective reduction of neuroleptics use for the management of Behavioural and Psychological Symptoms of Dementia. Intervention effectiveness continues after 6 months.

**Deliverables:**
- GeriatriCS Project: Support to Chronicity/Prescription Adequacy in Nursing Homes for the Elderly
- Pharmacotherapy guide for nursing homes (in Catalan)

**Research and methodologies**

**Scientific studies and evidence on issues related to adherence**

**Clinically consistent multimorbidity patterns from the Epichron cohort database**

**Organisations:** Aragón health sciences institute (IACS), EPICHRON research group on chronic diseases

**Location:** Spain

**Description:** The Epichron Cohort holds all relevant demographic, clinical and pharmaceutical information of patients living in Aragón (1.3 M inhabitants).

Data from electronic medical records in primary care, hospitals, specialised care, and emergency departments have been matched by record-linkage through a unique encrypted personal identification code. All registered morbidities have a date of diagnosis, enabling the selection of diseases and combinations of diseases in time.

Information on drug prescriptions includes type of medication, starting date and ending date and dose. Data on drug dispensing by the pharmacy office is also integrated in the Epichron Cohort. Each active ingredient is coded using the ATC Classification.

The large database generated enables the study of specific types of patients (e.g. older people), index diseases (e.g. diabetes, COPD, dementia), patterns of diseases (e.g. metabolic syndrome) and their relation with prescription profiles, quality of care, health services use, as well as pharmaco-epidemiological issues related to adverse drug events.

**Outcomes:** Non-random associations between chronic diseases result in clinically consistent multimorbidity patterns. Five patterns were identified: cardio-metabolic, psychiatric-substance abuse, mechanical-obesity-thyroidal, psychogeriatric and depressive. Underlying pathophysiological phenomena were observed both from a clinical and public health perspective. Significant gender differences showed a higher prevalence of the musculoskeletal and psychogeriatric patterns among women, probably due to a higher life
expectancy and/or worse health. Nevertheless, similarities were found in two European countries for the first three multimorbidity patterns. Also, specific patterns as the Induced Dependency and Falls pattern were found in geriatric patients.

Non-random associations in drug prescription result in patterns of polypharmacy that are sound from the pharmacological and clinical viewpoints. The information discovered would further the development of clinical guidelines for patients with multimorbidity and polypharmacy, and also endorses the use of primary care electronic medical records for the epidemiologic characterisation of multimorbidity. However, these findings necessitate from future longitudinal studies to confirm some of the proposed causal associations.

**Deliverables:**
- Scientific articles from the Epichron cohort database 50

**Drug-related problems in institutionalised, polymedicated elderly patients: opportunities for pharmacist interventions**

**Organisations:** Portuguese Pharmaceutical Society-Coimbra Branch (Reference Site Ageing@Coimbra).

**Location:** Portugal

**Description:** Medicines are associated with enormous health benefits but they also have potential to cause illness and death. A drug related problem (DRP) is an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes. Older people are at increased risk of DRPs due to multiple factors and would benefit from their prevention, detection and control.

The objective of the initiative was to evaluate the need for pharmaceutical care implementation in institutionalised, polymededicated older people.

A descriptive observational cross-sectional study was carried out in six Portuguese nursing homes. Inclusion criteria: age ≥65; ≥5 medications and ability to be interviewed. Pharmacists carried out an interview with each patient and consulted medical records. To identify DRPs, official drug information sources were consulted and the STOPP/START tool was used.

**Outcomes:** The results in 31 older patients (mean age 81.65 ± 6.86) showed a mean of 8 health problems (circulatory diseases the most common) and a median of 10 medicines/patient. Medicines targeting the cardiovascular, nervous and digestive systems were the most used. In total 484 DRPs were detected (median: 15 DRP/patient). The most common were non-allergic adverse drug events (ADRs); drug treatment more costly than necessary; effect of drug treatment not optimal and unnecessary drug treatment.

In conclusion, older patients in this sample are polymedicated and present a significant number of DRPs. We confirm the need for the implementation of pharmaceutical care services to improve medicines’ efficacy and safety and achieve better clinical outcomes.

**Deliverables:**
- Scientific article “Drug-related problems in institutionalized, polymedicated elderly patients:”

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50 https://webgate.ec.europa.eu/eipaha/library/index/show/id/1002

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opportunities for pharmacist intervention”51

European network of clinical trials units in older people (eurnet – clinitrop)

Organisations: SERMAS-Hospital Universitario de Getafe

Location: Spain

Description: This commitment aims to provide Randomised Clinical Trials (RCTs) focused on older people to guarantee and improve quality of the medications used in this population, diminishing the serious adverse events (ADR) and coping with the health (and functional) targets. Additionally, we provide computerised tools that facilitate prospectively active pharmacovigilance.

Computer tools and algorithms for ADR detection in elderly: implementing computerised tools to detect adverse drug effects in hospitalised older patients, using algorithm-based software stemming from the analytical data of the patients.

Guidelines on RCTs in older people: designing general and specific SOPs of our unit, protocols and information sheets adapted to our population.

Study on effect of exercise & multimodal intervention on incident frailty and disability in frail and pre-frail older patients with diabetes: close to 1000 subjects have been recruited and the first year of intervention has been finished in half of them.

Outcomes: This commitment has contributed directly to the promotion of health and quality of life in this population. Guidelines on RCTs with excellence provide support for researchers in different countries to design and develop CTs in older people helping in the design, recruitment and analyses. The development of clinical trials in older population improves the adherence to treatment decreasing the adverse events that occur in this specific population. Moreover, the implementation of computerised tools facilitates the active pharmacovigilance for diagnosis of adverse drug effects and prophylaxis. The contribution benefits to every older person – representing more than 14% in Europe and decreases the rate of hospital admission due to adverse events which amount to 30% in older people.

Deliverables:

- Computer tools and algorithms for ADR detection in elderly: National congress communication
- Guidelines on Randomised Clinical Trials (RCTs) in older people, Communication in e-health forum 2014, Athens53
- Scientific article “Interventional tools to improve medication adherence: review of literature”54
- Study on effect of exercise & multimodal intervention on incident frailty and disability in frail and pre-frail older patients with diabetes (Mid Frail)55

Improving Adherence and Concordance to long-term therapies in older patients at regional level

Organisations: AIFA Consortium.

Location: Italy

52 https://webgate.ec.europa.eu/eipaha/library/index/show/id/986
53 https://webgate.ec.europa.eu/eipaha/library/index/show/id/987
54 https://webgate.ec.europa.eu/eipaha/library/index/show/id/988
55 http://www.midfrail-study.org/

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**Description:** To implement a common and shared strategy to contrast poor adherence in Europe a number of knowledge gaps must be filled, and platforms providing base to prospective research exercises assembled. The AIFA Consortium aims to identify gaps in the common knowledge concerning prescription adherence (i.e. definition, causes, etc.) as well as in the area of interventions’ implementation, as indicated by partners’ commitments. The project has been divided in three main groups of activities, namely:

1. Monitoring adherence;
2. Development/implementation of interventions;
3. Data analysis and final report.

Each activity will be divided in different actions to be performed in a specific timeline, and ranked according to the aim to achieve the corresponding deliverables in due time and to complete and integrate them by the end of the project.

**Deliverable 1:** Adherence monitoring system: Develop an adherence monitoring system through the use of observatories and databases

**Deliverable 2:** Interventions addressed to improve adherence: Establish risk definitions to tailor interventions; groups of persons at higher risk of poor adherence will be identified through administrative databases; evaluate patients’ adherence-clinical outcome correlation

**Outcomes:** The commitment represents a multistakeholder effort to provide further insights for a more detailed understanding of the adherence issue in older people. Scientific evidence has been collected and analysed in order to provide objective information to support policy makers in defining effective interventions to improve older patients’ health. Moreover we highlighted the need to share information and integrate data at European level to better highlight inappropriate behaviours of both patients and health professionals. In that light specific indicators have been identified and tested in a collection of databases in order to link them to specific clinical outcomes. These indicators can be prospectively used to monitor the effectiveness of health interventions to tackle adherence.

**Deliverables:**
- Deliverable 1: scientific article submitted at the Clinicoeconomics and outcomes research journal

**MONitoring of prescription and improving ADherence to anti-OSTeoporotic treatments (MONADOS)**

**Organisations:** University of Florence, International Osteoporosis Foundation (IOF), European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO), Fondazione Italiana per la Ricerca sulle Malattie Ossee (FIRMO), Società Italiana di Ortopedia e Medicina (ORTOMED), Region of Tuscany.

**Location:** Italy

**Description:** The MONADOS project aims to improve adherence to treatments for osteoporosis at regional level through community-based interventions after analysis of prescriptions, applying and improving the model of the T.A.R.Ge.T.

56 November 2015
57 http://www.hindawi.com/journals/bmri/si/123602/
experience (Appropriate treatment of geriatric re-fractures in Tuscany). Prescription monitoring is possible by the analysis of unique regional databases such as the ones on medication prescription and hospital discharge. The intervention is specifically addressed to older people (> 65 years) after a major osteoporotic fracture (e.g. hip fracture). The intervention has been possible thanks to the creation of regional, multidisciplinary, hospital-based Fracture Units or Fracture Liaison Services linking the orthopaedic surgeon to the medical team and the general practitioner for secondary prevention of further osteoporotic fractures, which would greatly impair quality of life and survival. The intervention has also reduced resources waste due to poor adherence to therapy.

**Outcomes:** Analyses of regional prescription databases: New software for regional database analysis has been developed, spreading the information chronologically on individual timelines for each individual patient. Using this re-organised database it is possible to proceed with inferential advanced analyses using various models (GEE; LMM; GLMM). This type of data integration and in particular the use of external data management allows the integration of data extracted from the T.A.R.Ge.T. database with additional data extracted from the regional system. It allows to extend and integrate the analyses with information about use of other drugs (polypharmacy analysis) and other diseases (comorbidity analysis).

Fracture Liaison Service: Surgical and medical multidisciplinary teams are organised around patients who have suffered a major osteoporotic fracture. The percentage of patients undergoing antifracture therapy after the first event has significantly increased (+20% in the first year after hip fracture).

A reduction in secondary major fracture events in the long-term is expected (2017) along with a decrease in morbidity and mortality rates.

**Deliverables:**

- Scientific article: “The T.A.R.Ge.T. project: a regional program to reduce hip fracture in elderly patients. Main results of retrospective phase.”
- Scientific article: “Fracture prevention service to bridge the osteoporosis care gap.”
- Scientific article: “Changing patterns of prescription in vitamin D supplementation in adults: analysis of a regional dataset”

**Cost-effectiveness analyses / intervention analyses**

**The Skåne model, a model for medication reconciliation and review**

**Organisations:** Department of Medicines Management and Informatics, Skåne County Council

**Location:** Sweden

**Description:** In connection with admission to hospital, or prior to the patient’s annual visit and medication renewal by the general practitioner in primary care, a structured medication review is conducted on older patients with polypharmacy. The medication review is performed by a clinical pharmacist in collaboration with

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the responsible physician and in primary care also a nurse in the community. The pharmacist identifies drug-related problems and when needed recommends changes in drug therapy. Based on the identified drug-related problems and other clinical information the responsible physician decides changes in drug therapy, when possible together with the patient.

For patients admitted to hospital, the physician performs medication reconciliation at discharge resulting in a discharge summary. The discharge summary is given to the patient, the general practitioner and when needed the nurse in the community care or nursing home.

The model is gradually implemented in Skåne County Council.

**Outcomes:** The intervention has been shown to improve the process of care; it identifies and solves drug-related problems, reduces medication reconciliation errors and improves medication appropriateness. The intervention has also shown to improve clinical outcomes, reduce health care contacts and drug-related hospital admissions.

The effect of this model has been described in multiple publications and has also formed the basis for four PhD theses. Different methodology aspects have been studied in different studies.

** Deliverables:**

- Effects of Medication Reviews in accordance with the Skåne Model

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**Data repositories / databases**

**Analysis of unwarranted geographic variations in Avoidable Hospitalizations in Chronic Conditions in several European Countries**

**Organisations:** BIOMED ARAGON- Grupo ARIHSP

**Location:** Spain

**Description:** The commitment addresses two actions within A1 – contributing to research and to the creation of data repositories. To this end, ARIHSP within BIOMED Aragón provides several Atlases on unwarranted geographic variations in Potentially Avoidable Hospitalisations (PAH) in Chronic Conditions in Denmark, England, Portugal, Slovenia and Spain as well as a detailed report on the construction and quality of the data repositories that support this type of research. These series of atlases analyze the magnitude and the variation in unplanned hospitalisations for six chronic conditions: angina, adult asthma, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), dehydration and short-term complications of diabetes.

The interest of these atlases lays on the fact that the PAH have been proposed as an indicator of low value care, being adopted for, within- and cross-country health systems performance assessment.

**Outcomes:**


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61 https://webgate.ec.europa.eu/eipaha/library/index/show/id/983

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number of papers reflecting the work done by ECHO.

- Expert Group on Health Systems Performance Assessment (HSPA): in February 2014, the Council Work Party on Public Health at Senior Level invited Member States and the Commission to set up an Expert Group on Health Systems Performance Assessment (HSPA). The Expert Group was established in September 2014. ECHO outcomes were presented at HSPA third meeting in Brussels, 5 May 2015 under the title ‘ECHO – European Collaboration for Healthcare Optimisation: An international project on healthcare performance assessment’

**Deliverables:**
- PAH in 5 European countries[^62]
- Handbook on methods[^63]
- The ECHO project (website) 64

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**Integrated adherence monitoring system regarding patients with chronic conditions**

**Organisations:** CIRFF, Centre of Pharmacoeconomics, University of Naples Federico II

**Location:** Italy

**Description:** The (ongoing) project aims to develop and operate a remote monitoring and early warning system that can improve adherence to chronic diseases' treatment, by setting up an integrated system through the interconnection of different administrative databases (i.e. prescriptions, hospitalisations, ambulatory care). It also aims to set up a tool consisting of a set of indicators capable of identifying levels of adherence and persistence to treatment and indicators of appropriateness of drug use. An important part of this work is the identification of best approaches to describe and analyse adherence in chronic conditions, with special regard for older patients. Thus, the deliverables described below are an essential intermediary step in the project as whole.

**Outcomes:** Several publications have been produced and have been already accepted or are under review for publication. The level of adherence has been explored through analyses and reviews of administrative and clinical databases in the Campania region, providing all stakeholders with accurate and useful information supporting programs that use the information potential coming from administrative drug databases as well as research on adherence.

Our work also showed the potential of the Campania Region administrative databases for research. Finally, evidence was created about adherence promoting appropriateness of drug-use in real practice in the context of chronic diseases.

**Deliverables:**
- Scientific paper: “Assessment and potential determinants of compliance and persistence to antiosteoporosis therapy in Italy”[^66]
- Scientific paper: “Prescription patterns of antidiabetic treatment in the elderly. Results from Southern Italy”[^67]
- Scientific paper: “Inappropriate prescribing in elderly patients”[^68]

[^62]: http://echo-health.eu/echo-atlases/
[^63]: http://www.echo-health.eu/handbook/
[^64]: http://www.echo-health.eu/handbook/infrastructure.html

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### 6.2 Annex 2: Complete list of AG A1 individual commitments

#### Table 1. Individual Commitments

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Commitment</th>
<th>Country</th>
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</thead>
</table>
| ACRAF – Aziende Chimiche Riunite Angelini Francesco | 1. Development of spray platform for poorly soluble drugs for patients with difficulties in swallowing  
2. New foods for special needs | Italy       |
| AESGP – Association of the European Self-Medication Industry | 1. Self-care support in pharmacy  
2. Integrating self-care in the provision of care | Belgium     |
| Agenzia sanitaria e sociale regionale dell’Emilia-Romagna | Novel approach for improvement adherence to medical plans and medication | Italy       |
| AIFA – Agenzia Italiana del Farmaco | Improving adherence and concordance to long-term therapies in older patients at regional level | Italy       |
| Amsterdam Center on Aging | Amsterdam Center on Aging | The Netherlands |
| APSS Trento – Azienda Provinciale per i Servizi Sanitari | Prescription and adherence action at regional level | Italy       |
| Aston University | Medication management in older people | UK          |
| BIO-NET Leipzig Technologietransfergesellschaft mbH | Health competence as a key for improvement of the health status of ageing people | Germany     |
| BMA – Asociación Bio-Med Aragón | Bio-Med Aragón | Spain       |
| Catholic University of Portugal - Porto | Rede de cooperação das imandades e instituições de solidariedade - farmácia | Portugal     |
| CGCOF – Consejo General de Colegios Oficiales de Farmacéuticos de España | Adhiérete | Spain       |
| CIRIFF – Centro Interdipartimentale di Ricerca in Farmacoeconomia e Farmacoutilizzazione, University Federico II, Faculty of Pharmacy | An integrated adherence monitoring system regarding patients with chronic conditions | Italy       |
| Consejería de Sanidad y Política Social, Región de Murcia | Coalition for integrating care in patients with chronic diseases and promoting a healthy ageing | Spain       |
| CURIAMO – Centro Universitario Ricerca Interdipartimentale Attività Motoria | Healthy active personalised performances on youthful walking for ageing liberating knowledge | Italy       |
| Daichi Sankyo Italia | My Hypertension care | Italy       |
| Department of Health and Consumer Affairs of the Basque Government | Active patient: self-management and adherence | Spain       |
| Department of Health Social Services and Public Safety, Northern Ireland | 1. Medicines Adherence Programme  
2. Therapy through video conferencing | UK          |
| Deputy Directorate for Pharmacy and Medical Devices, Health department, Government of Catalonia | Health education program for older people on the proper use of medicines | Spain       |
| Education Health and Society Foundation | Programa Farmacéutico Experto (Expert Pharmacist) | Spain       |
| EPF – European Patients’ Forum | Improving adherence and concordance in long-term therapies in older patients at regional level | Belgium     |
| Fondazione Salvatore Maugeri, IRCCS | Educational intervention at home on medication adherence: the role of ICT | Italy       |
| GAMIAN-Europe – Global Alliance of Mental Illness Advocacy Organisations-Europe | Cooperation between stakeholders in mental health | Belgium     |
| GIRF – European Association of Pharmaceutical Full-line Wholesalers | Improving Adherence to long-term therapies in elderly at regional level (addition to AIFA project) | Belgium     |
| GlaxoSmithKline | Improving adherence to long-term therapies in the elderly at regional level | Belgium     |
| IDIAP Jordi Gol | Promoting active healthy ageing from Primary Health Care in Catalonia | Spain       |
| IK4 Research Alliance | IK4 for Adherence | Spain       |
| Inversión y Desarrollos Socio Asistenciales SL | Basic protocol for adherence | Spain       |
| Istituto di Ricerche Farmacologiche Mario Negri | Prescription of physical activity tailored to elderly people | Italy       |
| Medical Delta | Medical Delta | The Netherlands |

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### A1 Action Group on Prescription and Adherence to Medical Plans

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<th>Organization</th>
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EUROPEAN INNOVATION PARTNERSHIP ON ACTIVE AND HEALTHY AGEING

Prescription and Adherence to Medical Plans