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CHRODIS+
IMPLEMENTING GOOD PRACTICES FOR CHRONIC DISEASES

D 6.2 Pilot implementation and outcomes evaluation

WP6 Pilot Implementation of Integrated Care Model for Multimorbidity

Task 6.2 Pilot implementation and Task 6.4 Outcomes assessment and evaluation

Graziano Onder, Universita Cattolica del Sacro Cuore & Istituto Superiore di Sanita, Italy (main contributor and WP leader)

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Table of Contents

The CHRODIS PLUS Joint Action

CHRODIS PLUS is a three-year initiative (2017-2020) funded by the European Commission and participating organisations. Altogether, 42 beneficiaries representing 20 European countries collaborate on implementing pilot projects and generating practical lessons in the field of chronic diseases.

The very core of the Action includes 21 pilot implementations and 17 policy dialogues:

- The pilot projects focus on the following areas: health promotion & primary prevention, an Integrated Multimorbidity Care Model, fostering the quality of care for people with chronic diseases, ICT-based patient empowerment and employment & chronic diseases.
- The policy dialogues (15 at the national level, and 2 at the EU level) raise awareness and recognition in decision-makers with respect to improved actions for combatting chronic diseases.

A heavy price for chronic diseases: Estimates are that chronic diseases cost EU economies €115 billion or 0.8% of GDP annually. Approximately 70% to 80% of healthcare budgets across the EU are spent on treating chronic diseases.

The EU and chronic diseases: Reducing the burden of chronic diseases such as diabetes, cardiovascular disease, cancer and mental disorders is a priority for EU Member States and at the EU Policy level, since they affect 8 out of 10 people aged over 65 in Europe.

A wealth of knowledge exists within EU Member States on effective and efficient ways to prevent and manage cardiovascular disease, strokes and type-2 diabetes. There is also great potential for reducing the burden of chronic disease by using this knowledge in a more effective manner.

The role of CHRODIS PLUS: CHRODIS PLUS, during its 36 months of operation, will contribute to the reduction of this burden by promoting the implementation of policies and practices that have been demonstrated to be successful. The development and sharing of these tested policies and projects across EU countries is the core idea driving this action.

The cornerstones of CHRODIS PLUS: This Joint Action raises awareness of the notion that in a health-promoting Europe - free of preventable chronic diseases, premature death and avoidable disability - initiatives on chronic diseases should build on the following four cornerstones:

- health promotion and primary prevention as a way to reduce the burden of chronic diseases
- patient empowerment
- tackling functional decline and a reduction in the quality of life as the main consequences of chronic diseases
- making health systems sustainable and responsive to the ageing of our populations associated with the epidemiological transition

Authors and Acknowledgements

This report was prepared based on the work jointly performed by researchers involved in implementation of the Integrated Multimorbidity Care Model (IMCM) in five pilot sites in Italy, Lithuania and Spain. The following authors have contributed to this deliverable:

Katie Palmer[1], Carmen Rodriguez-Blazquez[2], Maria João Forjaz[2], Alexandra Prados-Torres[3], Antonio Gimeno-Miguel[3], Mabel Cano del Pozo[4a], María Bestué Cardiel[4a], Carmen Chaverri Alamán[4a], Kevin Bliek-Bueno[4b], Beatriz Poblador-Plou[3], Sara Luengo[4b], Inmaculada Guerrero-Fernández de Alba[4b], Ana Maria Carriazo[5], Carmen Lama[5], Rafael Rodríguez-Acuña[6], Inmaculada Cosano[7a], Juan José Bedoya[7b], Carmen Angioletti[1], Angelo Carfì[8], Antonella Di Paola[1], Rokas Navickas[9], Elena Jureviciene[9], Laimis Dambrauskas[9], Vytautas Kasiulevicius[9], Lina Venceviciene[9], Ida Liseckiene[10], Leonas Valius[10], Gediminas Urbonas[10], and Graziano Onder[11]

[1] Università Cattolica del Sacro Cuore, Rome, 00168, Italy
[2] National Centre of Epidemiology, Institute of Health Carlos III, Madrid, 28029, Spain;
[3] EpiChron Research Group, Aragon Health Sciences Institute (IACS); IIS Aragón; REDISSEC. Miguel Servet University Hospital, 50009 Zaragoza, Spain;
[4a] General Directorate of Health Care, Health Department, Government of Aragon, 50009, Zaragoza, Spain
[4b] Teaching Unit of Preventive Medicine and Public Health, Miguel Servet University Hospital, 50009, Zaragoza, Spain;
[5] Regional Ministry of Health and Families of Andalusia, Seville, E-41020, Spain;
[6] Andalusian Public Foundation Progress and Health (FPS), Seville, E-41092, Spain;
[7a] Servicio Andaluz de Salud (SAS), San José de la Rinconada-Los Carteros Primary Care Center, Seville, E-41300, Spain;
[7b] Servicio Andaluz de Salud (SAS), Tiro de Pichón Primary Care Center, Málaga, E- 29006, Spain;
[8] Centro di Medicina dell'Invecchiamento, Fondazione Policlinico Universitario "A. Gemelli" IRCCS, Rome, 00168, Italy;
[9] Vilnius University Hospital Santaros Klinikos, Vilnius, LT-08661, Lithuania;
[10] Family medicine clinic, Hospital of Lithuanian University of Health Sciences "Kauno klinikos", Kaunas, 50161, Lithuania;
[11] Department of Cardiovascular, Endocrine-metabolic Diseases and Aging, Istituto Superiore di Sanità, Rome, 0161, Italy;

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Abbreviations

ACIC	Assessment of Chronic Illness Care
CD	Chronic Disease
EU	European Union
IMCM	Integrated Multimorbidity Care Model
ISS	National Institute of Health, Italy
JA	Joint Action
LIWG	Local Implementation Working Group
MS	Member States
NCDs	Non Communicable Diseases
PACIC	Patient Assessment of Care for Chronic Conditions
SWOT	Strengths, Weaknesses, Opportunities, Threats
WP6	Work Package 6: Pilot Implementation of Integrated Multimorbidity Care Model

Glossary

Term	Definition
Chronic diseases	Diseases that are not passed from person to person. They are of long duration and generally slow progression. The four main types are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma), and diabetes. [1]

[1] WHO 2018

Executive Summary

1.Aim and scope of the report

An Integrated Multimorbidity Care Model (IMCM) was proposed by the first CHRODIS Joint Action (JA), which aims to overcome many of the issues related to fragmented care. The Model focuses on several limitations currently faced in the treatment of multimorbid patients. It recognizes that fragmented care may be due to a lack of integration between primary and hospital care services as well as between healthcare professionals from different specialties or disciplines. The IMCM, therefore, proposes sixteen components for the care and treatment of multimorbid patients. These components are categorized into five domains: Delivery of Care; Decision Support; Self-Management Support; Information Systems and Technology and Social and Community Resources. This theoretical model has been tested in WP6. More specifically, a methodology to implement the IMCM was developed (as reported in D6.1) and implemented in five pilot sites from Spain (*Region of Andalusia* and *Region of Aragon*), Lithuania (Vilnius University Hospital Santaros Klinikos, *VULSK*, Vilnius and Kaunas University Clinic, *Kauno Klinikos*, Kaunas), and Italy (Università Cattolica del Sacro Cuore, *UCSC*, Rome). The five sites were required to implement at least one component from the IMCM proposed by JA-CHRODIS, which proposed 16 components and each pilot site defined key performance indictors to measure the success of the respective interventions). Based on local experience and knowledge, participating sites adapted the IMCM to the specific characteristics of their local health care setting and developed country specific model versions, fully adapted and specified for local implementation.

2.Major Results of the Implementations

Although the implementation period has been short (one year on average), the following main benefits can be highlighted for:

Benefits/improvements for patients/participants/citizens:

- Patients´ self-perceived health care provision (PACIC questionnaire) improved, and most patients reported an improvement in quality of care after the intervention.
- Improvement in site specific key performance indicators, including unplanned potentially preventable hospitalizations, emergency room admissions, andquality of life was also documented.

Benefits/improvements for service providers/institutions:

- Use of resources was optimized, resulting in reduced use of health care resources (reduction in the number of visits to primary healthcare and number of emergency room and hospital admissions)
- Access to care was facilitated and care was better coordinated. The number of patients dropping out from the care process was reduced.

Benefits/improvements for Stakeholders and Policy Makers:

- A methodology to implement integrated care solutions for patients with multimorbidity was developed and tested in 5 pilot sites. This shows that with appropriate methodology and training, healthcare solutions can be standardized in different European countries and in different settings.
- The application of the IMCM can result in better care, reduced resource use, and improvement in patient outcomes.

3.Conclusions and Recommendations

Potential impact/value on the population targeted (if scaled up)

- Wider benefits for outcomes of patients with multimorbidity
- Improved coordination of care

- Optimization of available resources
- Definition of a common framework for the care of multimorbidity that can be implemented on a large scale

Comprehensive Assessment/Key limitations

Results of the implementation show:

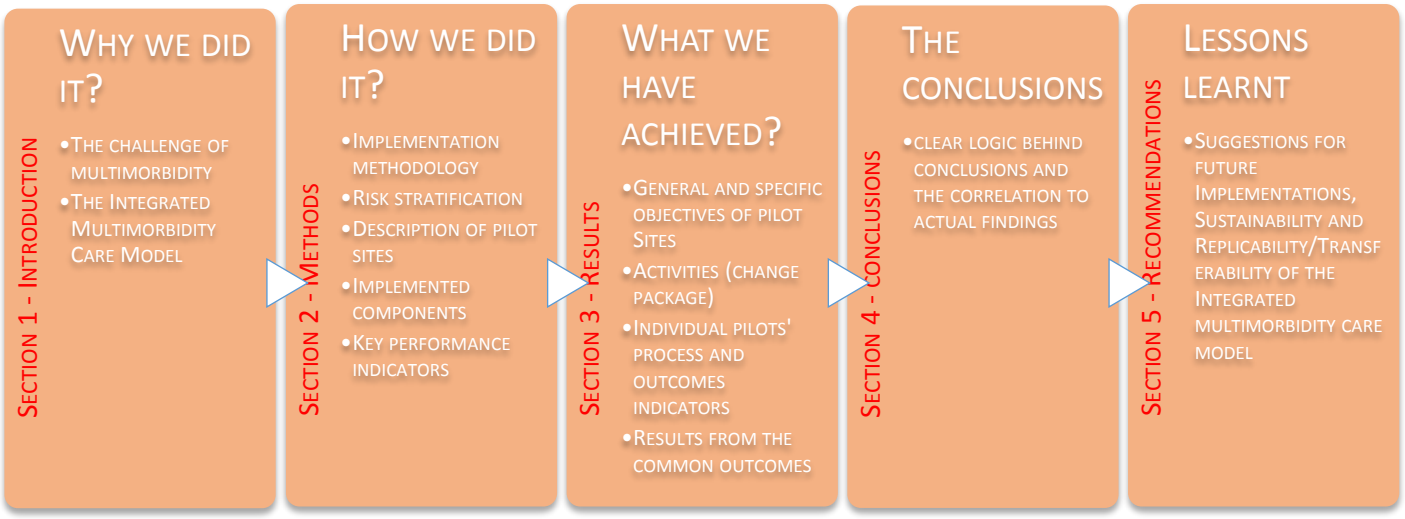
1. The applicability of the IMCM in different settings and countries
2. An improvement in quality of care from the perspective of the patient, healthcare providers, and managers, which was reported consistently in the 5 pilot sites.
3. The feasibility of a comprehensive approach to multimorbidity care which is achieved with limited resources and by a reorganization of existing resources.

Key limitations include the small scale implementation of the intervention and the lack of a cost-effective evaluation of the intervention

Suggestions for future Implementations, Sustainability and Replicability/Transferability of the IMCM*:*

1. Based on the evidence from D6.2 implementation review and update of national/local Healthcare strategies and plans for care and management of patients with multimorbidity is suggested. In order to ensure quality and sustainability of primary health care it is recommended for each Member State (MS) to review national health strategy sections for treatment of patients with multimorbidity and complement it relying on science-based methodological pilot implementations (such as case manager appointment, individual care plan, multi sectoral patient centered approach).
2. IMCM adaptation to local context and pilot scale up is encouraged. Political debate moderated by the Ministry of health at a national level (in all MS) to support the IMCM adaption to local context, implementation and encourage the scaling up of the practices, aimed at reducing the burden of chronic diseases should be organized.
3. Economic evaluation of the impact of scaling up the pilot sites experience is recommended in each MS. The long-term success of the IMCM intervention need to be further assessed and the economic evaluation of IMCM pilot implementation across different size and location stakeholders must be enforced by each MS nationally. Demands of primary healthcare services should be reviewed by each MS and modified considering pilot implementation findings.
4. A fine tuning of the IMCM can be proposed by a more pronounced involvement of patients in the development and by a detailed identification and targeting of barriers/opportunities related to implementation

Document orientation visual guide



Section 1 - Introduction

The challenge of Multimorbidity

Multimorbidity is the co-occurrence of multiple chronic diseases or conditions in a single individual. It has been described as the most common chronic condition as it has a high prevalence, especially in older individuals, where it affects more than 60% of people aged 65 or over (1). Multimorbidity patients are complex, particularly because they are more likely to have problems with mobility, self-care, and daily functioning than patients with one chronic disease, as well as cognitive impairment and frailty (2). This often results in a more challenging healthcare treatment. Many healthcare systems still focus on a more traditional disease-oriented approach. Consequently, multimorbidity patients frequently experience fragmented care (3, 4), and receive complex drug regimens and polypharmacy, which increase the risk of inappropriate prescribing, adverse drug reactions, and poor medication adherence (5).

The Integrated Multimorbidity Care Model

An Integrated Multimorbidity Care Model (IMCM) (6) was recently proposed, which aims to overcome many of the issues related to fragmented care. The Model was developed as part of Joint Action (JA)-CHRODIS (7) and focuses on several limitations currently faced in the treatment of multimorbid patients. It recognizes that fragmented care may be due to a lack of integration between primary and hospital care services as well as between healthcare professionals from different specialties or disciplines. Currently, although many healthcare professionals are well trained to manage single chronic diseases by following official guidelines for specific chronic diseases, they are not specifically trained to handle patients with multimorbidity. They also may be inexperienced in terms of adopting patient-centered care or shared-decision making that takes into account the patient´s preferences, needs, and expectations. The IMCM, therefore, proposes sixteen components for the care and treatment of multimorbid patients. These components are categorized into five domains: Delivery of Care; Decision Support; Self-Management Support; Information Systems and Technology, and Social and Community Resources. After development it was important to establish whether the model could be applied to different clinical settings in different European countries in order to establish the feasibility of local replicability.

Section 2 - Methods

Pilot Implementation of Integrated Multimorbidity Care Model

JA CHRODIS PLUS aims to support European MS through the implementation of cross-national policies and practices with demonstrated success to reduce the burden of chronic disease identified in JA CHRODIS. One of the main objectives of JA CHRODIS PLUS is to develop a methodology to implement the IMCM, described above (the 16 core components of the care model are illustrated in Table 1, with examples to describe each element). This process lead to the definition of a framework for the care of patients with multimorbidity, based on the key principles proposed by the IMCM, that could potentially be adapted and applied in local practices in European countries (6). Such a methodology needed to be assessed in terms of its effectiveness on clinical and process outcomes.

Table 1. Description of the 16 components of the Integrated Multimorbidity Care Model, with examples for each element.

16 elements of the care model system	*Examples*
Regular comprehensive assessment of patients	*At first examination and follow-up visits, patients should be assessed using standardized assessment tools where possible, along with a clinical interview.*
Multidisciplinary, coordinated team	*The patient should have access to multidisciplinary care both in terms of different professionals' roles(nurses, physicians, physiotherapists, social workers etc.), different levels of care (i.e., primary care, outpatient specialist care, hospitals), and different disease specializations.*
Professional appointed as coordinator of the individualized care plan ("case manager")	*A named case manager should be appointed who can act as coordinator between the patient and/or caregivers/family and members of the multidisciplinary team to manage care, actively linking the patient to providers, medical services, residential, social, behavioral, and other support services in the most effective way*
Individualized care plans	*Individualized, coordinated, and integrated plans for the treatment and long-term follow-up of patients should be developed based on the comprehensive assessment by the multidisciplinary team, including a patient-centered approach that considers the preferences of the patients, and the prioritization of a cross-disease, holistic approach, which includes targeting symptoms, functional ability, quality of life, desired patient out-comes etc.*
Decision support	
Implementation of evidence-based practice	*Healthcare providers should implement a flexible application of disease-specific evidence based guidelines, with consideration of polypharmacy, disease interactions, and drug–drug interactions.*
Training members of the multidisciplinary team	*Training should focus on a combination of the following themes: comprehensive assessment, multimorbidity and its consequences, health outcomes, adverse effects and interactions of drugs, use of technologies, implementation of individualized care plans, goal setting, working effectively as a team, communication, training in the critical appraisal of knowledge and evidence-based knowledge, patient-centeredness, patient empowerment,and self-management*
Developing a consultation system to consult professional experts	*A consultation system should be developed, to discuss patient care and treatment with other professional experts and specialists outside the core team (e.g. highly specialized medical specialists, and/or clinical psychologists with specific expertise, e.g. cognition, frailty).*
Self-management support	
Training of care providers to self-management support	*This should include encouraging and supporting patients to increase their health literacy, as well as tailored health promotion and prevention strategies.*
Providing options for patients and families to improve their self-management	*This can include offering multiple approaches (e.g. online courses, group-based courses, individualcounseling; dependent on patients' preferences and competencies) to strengthen patients' self-management and self-efficacy, including explaining their diagnoses and medical conditions, providing information on medication use, and training patients to use medical devices, supportive aids, and health monitoring toolscorrectly (e.g., blood pressure, glucose monitoring tools).*
Shared decision making (care provider and patients)	*Health care professionals should include the patient (and, where relevant, family and other informal caregivers) in making decisions about their care and treatment, including identifying their individual needs and deciding future goals and outcomes.*

Information systems and technology	
Electronic patient records and computerized clinical charts	*Electronic patient records and computerized clinical charts should be utilized, including any electronic technology used to enter data and manage patients' care, to keep track of medical history, diagnoses, symptoms, hospital visits, health care utilization, care needs, medications etc.*
Exchange of information between care providers and sectors by clinical information systems	*Different care providers should share information about a single patient, preferably using standardized tools and similar diagnostic systems.*
Uniform coding of patients´ health problems where possible	*The same classification system should beused to evaluate and record symptoms, diagnoses, medication, patient-reported outcomes, individualized care plans, and aspects of health care utilization between nurses, physicians, and other careproviders.*
Patient-operated technology allowing patients to send information to their care providers	*This cuold include technology tailored to the patient's needs which allows healthcare professionals to view, monitor, and react to information directly from patients via th etechnology (e.g., glucose levels, blood pressure etc.), to compliment face-to-face meetings.*
Social and community resources	
Supporting access to community- and social-resources	*Improving and supporting patient access to formal community-based resources, e.g., formal social care, patient associations, peer-support groups, and resources providing psychosocial support (e.g., home help, transportation).*
Involvement of social network (informal), including friends, patient associations, family, neighbors	*Building, supporting, and involving the patient's informal social network, including family, friends, patient associations, and neighbours with their treatment or care, and finding ways to increase their social support network.*

In the context of JA CHRODIS PLUS an implementation methodology was developed, which was piloted in five sites in Spain, Lithuania, and Italy, where the model was adapted and implemented according to local practices.

Survey to evaluate characteristics of the pilot sites

At the start of the project a survey was designed to assess characteristics of the five organizations that would be participating in the implementation. JA CHRODIS PLUS partners designed a questionnaire that aimed to collect information about the organizations and their planned care model programmes, across six dimensions: 1) General information; 2) Delivery of care and decision support; 3) Patient self-management; 4) E-health; 5) Community resources; and 6) Practice/Program Assessment. After development of the questionnaire, an online version was made accessible partners. The survey was used to identify common characteristic of the five pilot sites as well as to explore differences in features.

Patient risk stratification strategies

Pilot sites were asked to adopt a risk stratification process to ensure that care coordination would focus on patients who would benefit the most, thus maximizing the impact on both quality and costs. Risk stratification is defined as a systematic process to target, identify, and select patients who are at risk of poorer health outcomes, and who are expected to benefit most from an intervention. The process groups the population according to different risk levels and needs based on how likely people are to use services and resources. Risk stratification also allows an increase in detection rates and the identification of practices where improvement is necessary.

Definition of a risk stratification approach was based on the following steps:

- Define a target cohort of individuals at risk of poorer health outcomes that are considered a priority for targeting with different or additional interventions
- Identify individuals within the target cohort. This is achieved through manual or automated searching of routinely collected clinical and demographic data held in electronic databases using a standardised set of risk predictors.
- Select individuals, to match their needs to the most appropriate integrated care interventions, and envisage resources needed.

Risk stratification strategies were proposed as processes to target, identify and select patients who are at risk of poorer health outcomes, and who are expected to benefit of their intervention. Among the five pilots in WP 6 two used individual stratification approach whereas other two used a population based stratification to identify and select candidate patients for their intervention. One of the did not recognise its approach as formal, as it does case identification and selection based on the clinician training, knowledge, instinct and experience.

The most commonly used method was based on rules-based threshold and pre-established decision criteria that describe a high-risk patient. Precise inclusion criteria were used, including clinical diagnosis and parameters, functional status, health services utilization and/ social needs. The dimensions most commonly used were diagnosis, severity, patient-level clinical requirements and some specific characteristics (functional health status, pain, social/emotional support, activities of daily living, frailty, cognitive status and others) Only one relies only on non-explicit clinicians decision. All five programs used the described methods to identify, select and assess clinical requirements.

Implementation strategy

A common implementation strategy was developed for all the implementation pilot sites, which aimed to provide guidelines to facilitate the uptake of routine good practices, policies, and tools that wouldl later be implemented during the interventions. This implementation strategy was designed by JA CHRODIS PLUS coordinators, partners, and other dedicated experts.

Each of the five sites had a Local Implementation Working Group comprised of beneficiaries, collaborative partners, and local stakeholders. Although the composition of the Local Implementation Working Group could differ between sites, all of them had to include a core set of persons in the team, specifically: Organizer, Experts, Decision Makers, Front Line Stakeholders, and Implementers, see Table 2. The working groups involved four face-to-face meetings (when this was not possible, online meetings were held) of 2-3 hours' duration with specific tasks for each meeting: 1) SCOPE analysis; 2) SWOT analysis; 3) development and improvement of methodology; 4) final development of the Pilot Action Plan, see Figure 1.

Table 2. Local Implementation Working Groups; core set of participants and their relevant tasks and responsibilities.

- Organizer
  - *Plan, prepare, chair and run the group workshops*
  - *Run the secretariat (prepare agendas and minutes)*
  - *Write reports*
- Experts
  - *Provide knowledge and faculty on specific matters depending on the intervention selected*
- Decision makers
  - *Provide strategic vision*
  - *Support and sponsorship of the implementation process*
  - *Eliminate bottlenecks during the implementation process*
- Front-line stakeholders
  - *Give knowledge and expertise on real-life practice experience*
  - *Choose the right type of subject to implement*
  - *Motivate and empower implementers*
  - *Equip and support implementers to deal with the implementation*
- Implementers (could be same individuals as the front-line professionals)
  - *Implement the intervention following the agreed plan*
  - *Continuously assess the implementation process*
  - *Provide input and feedback to the local implementation group*

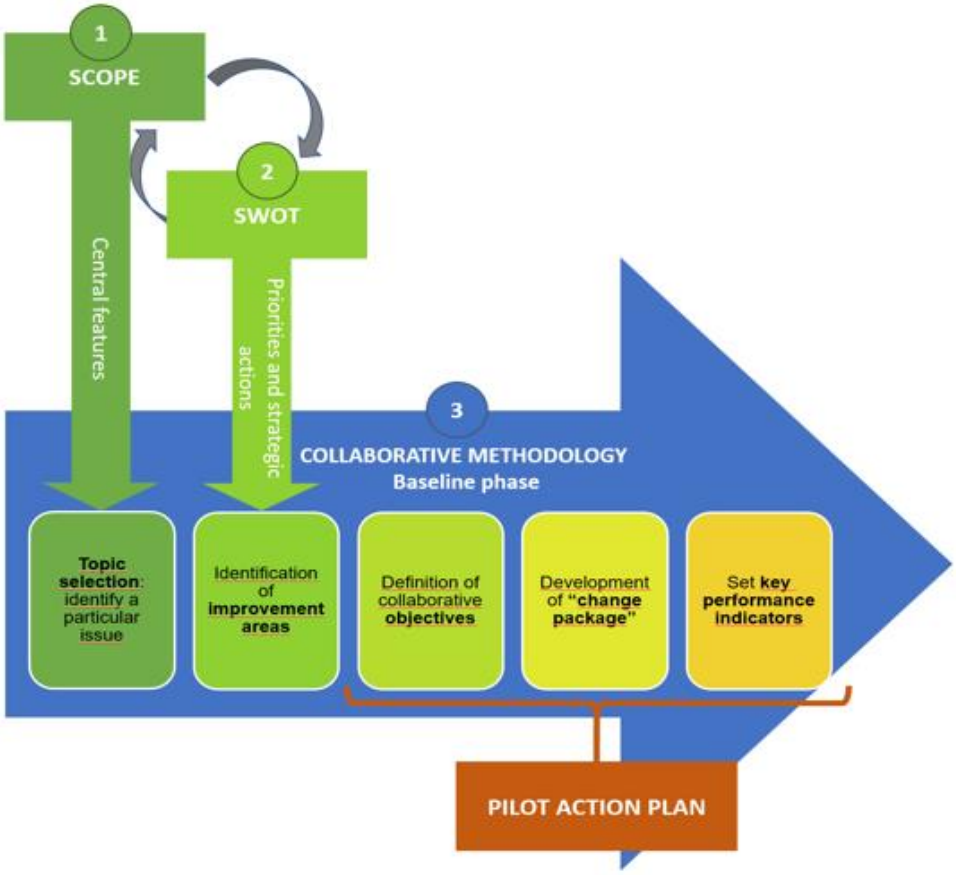


Figure 1. Implementation phases conducted by the Local Implementation Working Groups.

Implementation strategy step 1: SCOPE analysis

During the SCOPE analysis each Local Implementation Working Group selected the specific features or elements of their planned intervention (i.e., the IMCM), which were identified according to local needs, interests, and capabilities. A structured group discussion was used. Though the criteria for defining the SCOPE could differ between sites, they generally followed 5 steps: 1) Identify and describe the problem/challenge; 2) Describe the general purpose of the intervention; 3) Describe the target population; 4) Analyze the intervention's components and identify the central features that are essential to achieve the desired results and; 5) Select the components that would be implemented in the IMCM.

Implementation strategy step 2: SWOT analysis

Situation analysis – "strengths, weaknesses, opportunities, threats" (SWOT) was used to identify the respective organizations' internal strengths and weaknesses, as well as external opportunities and threats. SWOT is designed to help with both strategic planning and decision making in relation to the planned intervention. SWOT was chosen as a tool because it is a structured method that is comparable. This allowed us to compare the different analyses from the five sites.

During the SWOT analysis the working groups considered the strengths, weaknesses, opportunities, and threats to their proposed IMCM across five dimensions: 1) Sustainability; 2) Organization; 3) Empowerment; 4) Communication and; 5) Monitoring and evaluation. A template was devised to facilitate discussion. All five sites prepared a matrix that presented the most important strengths, weaknesses, opportunities, and threats for their organization, with an overview of major issues, priorities, and strategic actions needed.

Implementation strategy steps 3 and 4: development and improvement of methodology & final development of Action Plans

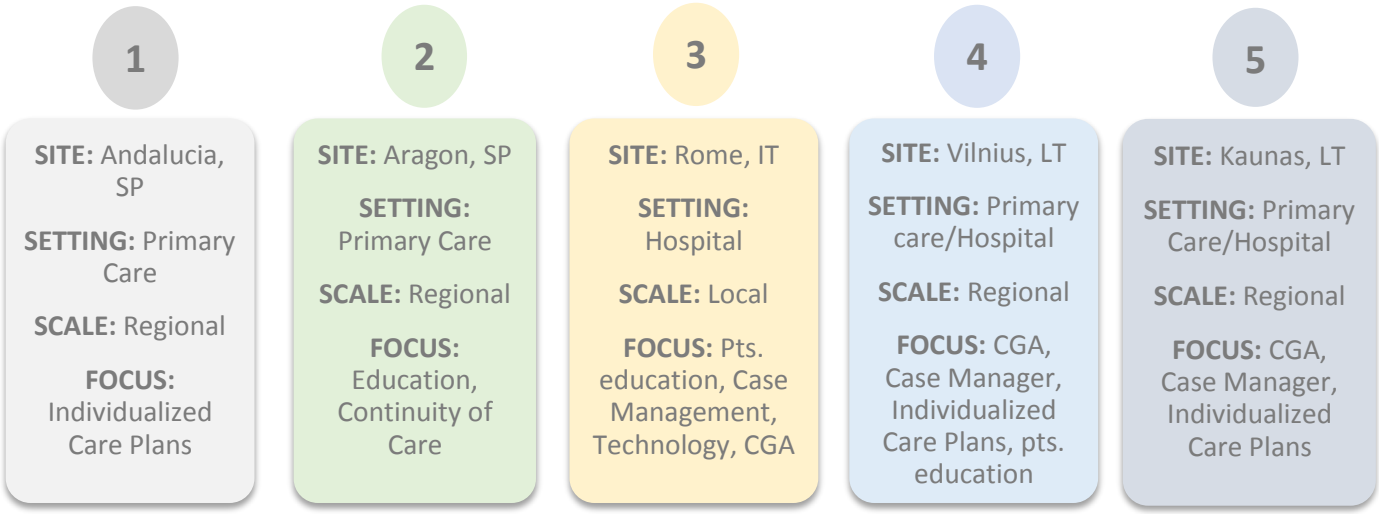
The methodology was developed and improved by the five Local Working Groups during the face-to-face meetings, leading to the development of an Action plan, which provide a concrete set of steps and activities that would need to be carried out in order to implement their respective care models. An adapted version of the iterative cyclic nature of the Collaborative Methodology (8) was used for drafting the local Action Plans. According to this methodology, the Working Groups addressed three main questions: 1) What are we trying to accomplish? 2) What changes can we make that will result in a successful implementation of the IMCM and improvement? 3) How will we know that a change is an improvement? These questions were used to develop a concrete Action Plan, which was devised in five steps (see Table 3).

Table 3. Five steps used to define Action Plans for the IMCM

Identify the specific issues to work on The central features or elements of the intervention were already selected during the definition of the SCOPE. These included components of the Integrated Multimorbidity Care Model (6) *Detect improvement areas* Based on the SWOT analysis, the working groups identified specific areas for improvement. *Define specific objectives* According to the improvement areas detected, the working groups developed achievable and realistic objectives. *Develop the Change Package* Based on the improvement areas and the associated objectives, concrete activities were described in a "Change Package", which included a set of changes that could lead to improvement and successful implementation of IMCM during the Implementation Phase. Each objective defined in the previous step required at least one activity. *Set key performance indicators* Key performance indicators were defined to ensure that the expected impact of the interventions could be accurately measured. Depending on the site, the indicators could either be health-related outcomes, process indicators, or both. The targets had to be achievable and measurable. Existing data was chosen to measure progress.

Description of the pilot sites

The IMCM was implemented in five pilot sites from Spain (*Region of Andalusia* and *Region of Aragon*), Lithuania (Vilnius University Hospital Santaros Klinikos, *VULSK*, Vilnius and Kaunas University Clinic, *Kauno Klinikos*, Kaunas), and Italy (Università Cattolica del Sacro Cuore, *UCSC*, Rome).



As described in the method section, a survey was carried out at the start of the project to identify characteristics of the participating centers before the implementation of the IMCM. Results of the survey revealed some common goals for the five pilot sites such as the aims to increase multidisciplinary collaboration, promote evidence-based practice, and reduce inequalities in access to care and support services. A summary of some of the key features is illustrated in Table 4. Most of the implementers considered it important to involve GPs and nurses in delivering care to patients; indeed, the majority of patients were identified via primary care settings. In all cases the main care providers were either GP physicians or nurses (or they were involved in the multidisciplinary meetings). Case managers were appointed in the majority of interventions (usually a physician), and many also included a social worker as part of the core multidisciplinary team. All five sites reported that their patients would undergo comprehensive assessment at the start and end of the integrated care process, but few included a regular periodic assessment in-between. Most of the programs reported some key common characteristics of the intervention and services; patient education, follow-up visits, and referrals between medical specialties were reported by all five sites, and clinical (diagnostic/monitoring) tests in 80%. However, other characteristics of the intervention and services differed somewhat between settings.

Most sites reported use of technology in their interventions. For example, 80% offer E-Health services, and half of the multidisciplinary team meetings were conducted virtually. All five sites report using digital healthcare communication tools; these were mostly e-referral but other aspects like virtual conferences with patients and online appointment schedules were reported. Three quarters of the sites had electronic systems for registering/monitoring care processes, and all used Electronic Health Records. However, none of the programs used electronic decision support systems. The survey also highlighted some noticeable absences, especially in terms of community and social resources. In fact, only one site reported that they directly support patients in accessing community and social resources.

Components in the planned interventions.

The five sites were required to implement at least one component from the 2018 Multimorbidity Care Model proposed by JA-CHRODIS (6), which included 16 components. Table 5 describes which elements were chosen to be included in each site's intervention. Kauno Klinikos implemented 13 of the 16 components and three sites (Kauno Klinikos, UCSC, and VULSK) included components from all of the five domains. Andalusia's intervention focused only on the "individualized care plan" component. Most sites (80%) included regular, comprehensive assessment of patients, a multidisciplinary team, a case manager, individualized care plans, and shared decision making between patients and care providers. Only one site (Region of Aragon) provided training to care providers on supporting patient self-management, while another (UCSC) included patient operated technologies that allow patients to send information to their care providers.

Table 4. Characteristics of the five pilot sites.

	Region of Andalusia	Region of Aragon	UCSC	VULSK	Kauno Klinikos
Country	Spain	Spain	Italy	Lithuania	Lituania
Patients	Patients with multimorbidity (2+ diseases)	Complex Chronic Patients with multimorbidity and polypharmacy	Adults with dementia or Down syndrome and multimorbidity	Patients with multimorbidity (2+ diseases)	Patients with multimorbidity (2+ diseases)
Age		≥65 years	≥65 years	45-70	45-70
Target number of patients	200	200		200	
General aim	Assess the application of individualized care plans	Educational measures for healthcare professionals + patient-centered care	Improve case coordination, and provide patients with a reference care provider (+technocare)	Implementation of intergrated care model	Implementation of intergrated care model
Care coordinator / case manager	No	GP / nurse	Yes	Yes	nurse or advanced nurse practitioner
Setting	Primary healthcare centres of the Andalusian Health Service	Different Primary Care Health Centres	Outpatient clinic	Centre of Family Medicine (Family Doctor Offices, Offices of Odontologist of General Practice and Tooth Prosthesis and Office of Primary mental health care).	2 public primary health care centers (1 urban, 1 rural)
Implementation	All pilots included a 6-month run-in period, followed by a 12-months implementation period.				

Table 5. Components of the Integrated Multimorbidity Care Model implemented in each pilot site.

	Region of Andalusia	Region of Aragon	VULSK	UCSC	Kauno Klinikos
Delivery of the care model system					
Regular comprehensive assessment of patients		Yes	Yes	Yes	Yes
Multidisciplinary, coordinated team		Yes	Yes	Yes	Yes
Professional appointed as coordinator of the individualized care plan ("case manager")		Yes	Yes	Yes	Yes
Individualized care plans	Yes	Yes	Yes		Yes
Decision support					
Implementation of evidence based practice			Yes	Yes	Yes
Training members of the multidisciplinary team		Yes	Yes		Yes
Developing a consultation system to consult professional experts		Yes	Yes		Yes
Self-management support					
Training of care providers to self-management support		Yes			
Providing options for patients and families to improve their self-management			Yes	Yes	Yes
Shared decision making (care provider and patients)		Yes	Yes	Yes	Yes
Information systems and technology					
Electronic patient records and computerized clinical charts		Yes	Yes		Yes
Exchange of information between care providers and sectors by clinical information systems		Yes	Yes		
Uniform coding of patients´ health problems where possible				Yes	
Patient-operated technology allowing patients to send information to their care providers				Yes	
Social and community resources					
Supporting access to community- and social- resources			Yes		Yes
Involvement of social network (informal), including friends, patient associations, family, neighbors			Yes	Yes	

Key performance indicators

During development of the Action Plans, each pilot site defined key performance indictors to measure the success of the respective interventions. A common approach was chosen for assessing the impact of the interventions that consisted both of a quantitative and qualitative analysis. The specific key performance indicators for each site are described in Table 6. There were some common indicators between sites, particularly Kauno Klinikos & VULSK, who defined a similar set of indicators.

The Assessment of Chronic Illness Care (ACIC) (9) questionnaire was chosen as an appropriate qualitative measure. ACIC is responsive to changes that care teams make in their healthcare systems and correlates well with other measures of productivity and system change. It consists of six elements that were proposed in the Chronic Care Model, namely; Health care organization; Community linkages; Self-management support; Decision support; Delivery system design and; Clinical information systems. The Patient Assessment of Care for Chronic Conditions (PACIC) (9) was also selected for qualitatively measuring outcomes of the interventions. This tool measures specific actions or qualities of care that patients report they have experienced during the intervention. The actions are congruent with the Chronic Care Model and consist of 20 items.

Table 6. Specific Key Performance Indicators at five pilot sites that implemented the Integrated Multimorbidity Care Model

Region of Andalusia	***Region of Aragon***	**UCSC**	***Kauno Klinikos* & VULSK**
-The Patient Assessment of Care for Chronic Conditions (PACIC) -Assessment of Chronic Illness Care (ACIC) questionnaire -Number of health districts participating in the pilot -Number of patients included in the sample -Drawing up and delivering the Individualized care plans -Rate of unplanned hospitalisation potentially preventable achieved (%) in 12 months.	-The Patient Assessment of Care for Chronic Conditions (PACIC) -Assessment of Chronic Illness Care (ACIC) questionnaire - Existence of a document describing the functions/role of the case manager - Percentage of patients included in the program with case manager identified - Number of Primary Care teams included in the program - Implementation of a chronic care unit at the hospital - Identification of personnel of reference at hospital´s chronic care unit - Number of admissions to the emergency room in 12 months - Number of hospitalizations in 12 months - Number of avoidable hospitalizations in 12 months - Number of health professionals who accept to do the training course and start it - Number of health professionals who finish the training course - Increment of knowledge as the difference of mark in a test on skills in multimorbidity done before and after the training course - Satisfaction of the training course by health professionals (mark given to the course) - Number of interconsultations/patient - Number of interconsultations in 12 months - Percentage of interconsultations to professional	-The Patient Assessment of Care for Chronic Conditions (PACIC) -Assessment of Chronic Illness Care (ACIC) questionnaire -A survey will be administered in the outpatient context at the start of the quality improvement intervention and 10 months after the rollout process. -Reduction of unnecessary referrals (-Reduction of accessibility in Emergency Department (ED) and subsequent hospitalizations -Percentage of drop-outs (number of missing appointments by patients with Alzheimer Disease and DS/ number of fixed appointment for patients with Alzheimer Disease and DS) calculated as an index for poor coordination of care Technocare -Average number of contacts recorded in 12 months -Percentage of extra contacts for Lazio region	-The Patient Assessment of Care for Chronic Conditions (PACIC) -Assessment of Chronic Illness Care (ACIC) questionnaire -The number of unplanned visits in 12 months -The number and duration of hospitalizations, admissions to emergency room and avoidable hospitalizations in 12 months -Number of incompatible drugs combination (drug interaction rate) -Existence of a guidelines that describes the role of case manager -% of patients with individualized care plan based on a comprehensive assessment. -Number of visits to Primary Care team in 12 months per patient. - Number of consultations / 12 months. -EQ-5D questionnaire is a standardized instrument developed by the EuroQol Group as a measure of health-related quality of life -The EQ VAS, patient's self-rated health on a vertical visual analogue scale.

	of reference/total consultations to all specialties - Percentage of response to interconsultations in less than 48 h - Existence of a module of information shared among professionals in the EHRs - Percentage of patients with individualized care plan based on a comprehensive assessment - Number of visits to Primary Care team per patient in 12 months	-Percentage of drop-outs (Percentage of patients with Alzheimer Disease and Down Syndrome who disattend the fixed technocare appointment/ number of patients with Alzheimer Disease and Down Syndrome who fixed technocare appointment) -Percentage of rescheduled techno visits (Percentage of rescheduled visits for patients with Alzheimer Disease and DS/ number of patients with Alzheimer Disease and Down Syndrome who fixed technocare appointment -Number of patients with Alzheimer Disease and Down Syndrome that participate at the group meeting	

Section 3 - Results

Brief description of the results in the five pilot sites across Europe.

This section describes the main results of the implementation in the 5 pilot sites. Detailed information for each site are presented in the Short Template for Final Reporting in Appendix 1. The Short Template for Final Reporting was developed by CHRODIS PLUS partners with the aim to provide a snapshot with the description of the essential aspects of the Pilots: objectives, activities, results (indicators), the benefits for the beneficiaries and major stakeholders and the recommendations for future sustainability and replicability-scaling up of CHRODIS PLUS Models, Tools, and Good Practices. It summarizes the CHRODIS PLUS Full Template for Reporting.

Region of Andalusia (Appendix, Table 1)

The Andalusian site's main objectives was better management of complex chronic patients to improve their health status by the systematic application of Personalized Care Plans. 2788 patients were included and followed in the Andalusian pilot in 372 primary healthcare centers within 32 health districts. 8388 healthcare professionals underwent training, including i) awareness-raising sessions, ii) training sessions on complex chronic patient management and Personalized Care Plans through the "OPIMEC" platform, before drawing up and delivering the Personalized Care Plans.

Of the 350 Personalized Care Plans assessed, 4.6% met all requirements, 76.9% were fully filled but did not meet all requirements, and 18.5% were not fully filled. In terms of health outcomes (defined as service utilization, see Table 7) there was a decrease from 2018 to 2019 in family physicians' visits at primary healthcare centers, family nurses' visits at primary healthcare centers, emergency episodes at primary healthcare centers, and outpatient visits. Whereas an increase was observed in unplanned potentially preventable inpatient episodes, family physician home-visits, family nurses home-visits, inpatient episodes, and emergency episodes at hospitals. In terms of health outcomes (defined as service utilization) there was an increase both from 2017-2018 and 2018-2019 in unplanned potentially preventable inpatient episodes, family physician home-visits, family nurses home-visits, and emergency episodes at hospitals. Observed costs for 2019 (20.541.162,59 €) were lower than expected costs (24.726.246,52 €).

Table 7. Health Outcomes (Service utilisation)

Indicator	2017 (n)	2018 (n)	2019 (n)	2018 Vs 2017 (%)	2019 Vs 2018 (%)
Unplanned potentially preventable inpatient episodes	472	647	751	37,1%	16,1%
Family physicians' visits at PHC	35,471	39,630	36,049	11,7%	-9,0%
Family nurses' visits at PHC	33,331	41,767	40,350	25.3%	-3.4%
Family physician home-visitis	543	903	1,499	66.3%	66.0%
Family nurses home-visitis	8,431	12,176	13,746	44.4%	12.9%
Emergency episodes at PHC	3,408	3,841	3,716	12.7%	-3.3%
Emergency episodes at hospitals	2,647	3,032	3,102	14.5%	2.3%
Outpatient visits	14,635	16,048	15,421	9.7%	-3.9%
Inpatient episodes	1,121	1,382	1,402	23.3%	1.4%

PHC=primary healthcare centers

Region of Aragon (Appendix, Table 2)

In the Region of Aragon the implementation aimed to improve the provision of health care and patient´s self-perceived quality of care via comprehensive, regular assessment of patients, using agreed individualized care plans, with a designated case managers the creation of hospital chronic care unit, and a newly-designed form for sharing patients´ information. A five-week online training course (eMULTIPAP) was designed to improve healthcare professionals´ skills on multimorbidity, polypharmacy, person-centred care and shared-decision making. In addition, the implementation included a socio-family assessment of patients and, where necessary, referral of patients to a social worker.

The pilot implementation included 291 patients of over 65 years of age in 21 primary care teams (i.e., general practitioner-nurse) from 13 primary care health centers, internists from 3 general hospitals, policy makers, healthcare managers and researchers. At the end of the implementation, all patients had a designated case manager and an individualized care plan. Up to 96.7% of them had their social context assessed, and 3.3% were referred to a social worker. During the 1-year implementation, the average number of hospitalizations, emergency visits and visits to primary care varied from 0.64 to 0.69, from 1.55 to 1.24, and from 49 to 42, respectively. Up to 87.5% of patients reported an improvement in healthcare after the intervention. The online training was started by 100% of implementing professionals and 89.1% (49/55) completed the course, with a satisfaction score of 8.3/10 and an impact score of 3.8/5. Professionals improved their multimorbidity management skills from 7.36 to 9.18/10 in pre- and post-course exams.

UCSC (Appendix, Table 3)

The implementation in UCSC aimed to improve Multimorbidity management in elders with dementia and adults with intellectual disability through the use of trained case managers, a multidisciplinary team, and comprehensive assessment. In addition they created a techno care work station and provided group meetings for patients and family members. A total of 265 subjects were included in the study at the UCSC pilot site. In 2019, all 265 patients were managed by the case manager. There was a decrease of 66.7% in the number of Emergency Department accesses from 2018 to 2019 (3.4% and 1.1%, respectively). In 2019

92.8% less missed appointments were registered compared to 2018 (1.9% and 26% respectively). There were 105 techno care visits successfully carried out, and no visits were missing during the observation period. Two sessions of focus group meetings with patients and their family members were completed. The results of the relative's customer satisfaction surveys revealed that 63.6% rated their satisfaction with the focus group activities as positive and felt that the service helped them understand their condition. All participants rated "positive" or "partially positive" to the question of whether they would suggest the service to someone else. There were no "negative" responses to any of the survey questions.

VULSK (Appendix, Table 4)

The pilot implementation at VULSK aimed to improve i) professionals' knowledge and capacity in multimorbidity patient management and coordination through levels of care, ii) patients' awareness and capacity for self-management and iii) patients' access to services, including community and social resources. This was done activities focusing on 13 components of the IMCM, including collecting information on patients' needs and expectations regarding their condition and barriers to care, providing them with self management education courses, and involving them in decision-making, among others (see Appendix, Table 4). A total of 195 subjects were included in the study at the VULSK pilot site. 60% of patients (from 120 who have been questioned) reported positive changes in the care they received in the previous 12 months. All patients underwent comprehensive assessment and 97.4% had an individualized care plan. There was a small post-implementation increase of 0.73% in the Health status scale score (EQ-5D total score) and a 4.65% decrease in the number of patients reporting problems in self-care (EQ-5D). A third of patients reported no change in the degree of care they had received in the past 12 months, whereas 39.2% reported a minimal improvement, and 20.8% much improvement. There was a significant decrease ($p<0.001$) in the average number of active medical substances used per patient between their first (mean=7, SD=3.3). and last medical visits (mean=5.4, SD=3.1)

Kauno Klinikos (Appendix, Table 5)

The pilot implementation at Kauno Klinikos aimed to improve the continuous assessment, self-management and care of patients while improving the knowledge of healthcare professionals for managing multimorbid patients. This was done by using comprehensive assessment, individualized healthcare plans, with a multidisciplinary team who worked according to specific guidelines, with a case manager and a consultation support system. 201 patients were included in the implementation. The pilot was performed in Lithuanian University Hospital „Kauno Klinikos" (represented city and public health center) and in" Kaltinenai" PHC center (represented rural area, public health center). All interventions were related to components across five domains: Delivery of Care, Decision Support, Self-Management Support, Information Systems and Technology, and Social and Community Resources). The target population was patients with multimorbidity aged 40 -75 years old. All patients were screened for mental problems and polypharmacy incompatible drug-drug interactions and underwent consultation by the multidisciplinary care team. The mean number of hospitalizations per year reduced by 0.4 and Emergency Department visits by 0.2. The number of ambulatory primary care visits per year decreased by 15.2.

Results from the common outcomes: Patient Assessment of Care for Chronic Conditions (PACIC+) and Assessment of Chronic Illness Care (ACIC)

Commonly to all sites, self-perceived patient care was assessed through the 26-item Patient Assessment of Care for Chronic Conditions (PACIC+) survey (9), which measures specific actions or qualities of care that patients report to have experienced during their interactions with the delivery system. The perspective of the health system teams was analyzed with the Assessment of Chronic Illness Care (ACIC) survey (10), a practical quality-improvement tool to help organizations evaluate the strengths and weaknesses of their care delivery for chronic illnesses. Both questionnaires were collected and analyzed before and after the 1- year model implementation.

Before the implementation, members of the implementation teams completed a total of 14 ACIC surveys (two from Andalusia -one filled by one member and the other one by three professionals in a consensus exercise, three from Aragon, two from Rome, two from Kaunas, and five from Vilnius). After the implementation, 17 ACIC surveys were completed (5 from Andalusia, 3 from Aragon, 2 from Rome, 2 from Kaunas, and 5 from Vilnius). A convenience sample of 208 patients (52 from Andalusia, 61 from Rome, 50 from Kaunas, and 45 from Vilnius) completed the PACIC+ survey pre- and post-implementation, and 18 patients from Aragon completed the PACIC+ post-implementation.

ACIC

The ACIC (version 3.5) (10) assesses the strengths and weaknesses of delivery of care for chronic illness in seven areas: delivery system organization (Part 1), community linkages (Part 2), self-management support (Part 3a), decision support (Part 3b), delivery system design (Part 3c), clinical information systems (Part 3d), and integration of model components (Part 4). The ACIC was applied in each site pre- and post-implementation. Items are scored from 0 (the lowest level of support) to 11 (the optimal level of support). Scores for each section are obtained by summing the values for all items within a section and dividing by the number of items within that section (range: 0-11). The overall score is derived by summing the average scores of each section and dividing by the number of sections administered (range: 0-11). The following ranges for quality of care levels have been established: 0-2 for limited support for multimorbidity care; 3-5 for basic support for multimorbidity care; 6-8 for reasonably good support for multimorbidity care; and 9-11 for fully developed support for multimorbidity care (11). The ACIC was completed by members of the implementation team or healthcare system with a good knowledge on the implementation site characteristics (decision maker, front-line stakeholder, or implementer). The ACIC is responsive to changes that care teams make in their healthcare systems and correlates well with other measures of productivity and system change.

PACIC+

The PACIC+ was selected for quantitative outcome assessment of the interventions as perceived by the patients. PACIC+ consists of 26 items. Items are scored from 1 (almost never) to 5 (almost always). The PACIC+ allows for a scoring method derived from the '5As' model of behavioral counseling that defines five measurable outcomes: assess, advise, agree, assist, and arrange (12). These dimensions measure the improvement in self-management support and linkages to community resources (13). A global '5As' summary score was also calculated, resulting from the average of items 1-4 and 6-16. The PACIC+ has been translated into several languages, thus Lithuanian, Italian and Spanish versions were used.

ACIC results

The pre-post implementation comparison of ACIC domains and total score is displayed in Table 8. Pre-implementation ACIC total mean scores ranged from 3.70 in Vilnius to 7.90 in Andalusia. Post-implementation ACIC total mean scores varied from 5.52 in Vilnius to 8.04 in Kaunas. An increase in ACIC scores was also found across sites except in Andalusia, although they were not statistically significant in general (Figure 2). For the total sample, there was a significant increase in ACIC scores at the end of the intervention in Parts 3b to 4 (e.g., decision support, delivery system design, clinical information systems, and integration of model components) and ACIC total. Effect sizes ranged from 0.58 (Part 1) to 1.10 (Part 4) for ACIC dimensions, and it was 0.83 for ACIC total score.

Table 8. Mean scores of ACIC survey subscales and total scale, before (pre) and after (post) implementation of the Integrated Multimorbidity Care Model (IMCM), by site.

		Andalusia			Aragon			Rome			Kaunas			Vilnius			Total			
		Mean	**SD**	**p**	**Mean**	**SD**	**p**	**Mean**	**SD**	**p**	**Mean**	**SD**	**p**	**Mean**	**SD**	**p**	**Mean**	**SD**	**p**	**ES**
Part 1	**Pre**	10.42	0.59		6.39	1.89		8.33	1.41		6.58	0.35		5.01	0.87		6.91	2.16		
	Post	8.40	1.46		8.44	1.51		8.92	0.59		8.92	0.35		6.88	1.42		8.16	1.39		
	Diff	-2.02		0.130	2.05		0.216	0.59		0.644	2.34		0.022	1.87		0.066	1.25	1.65	0.07	0.58
Part 2	**Pre**	8.17	0.24		5.11	1.68		5.33	0.47		5.50	1.18		4.00	1.25		5.33	1.72		
	Post	7.40	2.16		7.11	1.83		6.50	2.12		7.50	0.24		4.75	0.63		6.58	1.84		
	Diff	-0.77		0.657	2.00		0.236	1.17		0.527	2.00		0.143	0.75		0.324	1.25	0.86	0.07	0.72
Part 3a	**Pre**	7.62	0.88		6.42	2.31		5.12	3.00		5.12	0.88		3.94	1.16		5.44	1.98		
	Post	6.60	1.72		7.92	1.91		6.75	3.18		8.00	0.35		4.88	1.76		6.61	2.00		
	Diff	-1.02		0.475	1.5		0.435	1.63		0.652	2.88		0.051	0.94		0.408	1.17	1.35	0.12	0.59
Part 3b	**Pre**	7.50	1.06		4.75	2.54		4.13	2.30		5.38	0.88		3.06	0.43		4.65	2.01		
	Post	5.90	2.07		6.89	1.05		4.50	2.83		8.88	1.18		6.13	1.45		6.34	1.92		
	Diff	-1.6		0.362	2.14		0.249	0.37		0.898	3.5		0.032	3.07		0.007	1.69	1.21	0.02	0.84
Part 3c	**Pre**	8.17	0.71		6.72	2.04		5.42	0.59		6.08	0.59		4.17	0.76		5.86	1.73		
	Post	6.73	1.30		8.50	1.20		7.67	0.71		9.50	0.47		6.13	1.74		7.38	1.65		
	Diff	-1.44		0.216	1.78		0.263	2.25		0.074	3.42		0.024	1.96		0.085	1.52	1.74	0.02	0.88
Part 3d	**Pre**	7.40	1.41		6.20	3.12		4.20	1.41		3.50	1.27		3.00	0.54		4.68	2.28		
	Post	6.84	0.92		7.67	2.68		5.40	0.85		6.90	1.27		4.90	1.99		6.34	1.81		
	Diff	-0.56		0.548	1.47		0.571	1.2		0.412	3.4		0.116	1.9		0.115	1.66	3.32	0.03	0.73
Part 4	**Pre**	6.00	0.47		3.94	2.42		2.92	1.30		4.08	0.35		2.71	0.77		3.74	1.63		
	Post	5.50	1.60		6.11	1.84		4.92	0.59		6.58	1.06		4.96	1.81		5.54	1.50		
	Diff	-0.50		0.697	2.17		0.285	2.0		0.185	2.5		0.087	2.25		0.063	1.8	.976	0.01	1.10
Total	**Pre**	7.90	0.29		5.65	2.20		5.06	1.50		5.18	0.43		3.70	0.72		5.23	1.78		
	Post	6.77	1.39		7.52	1.64		6.38	1.35		8.04	0.14		5.52	1.30		6.71	1.45		
	Diff	-1.13		0.330	1.87		0.303	1.32		0.454	2.86		0.012	1.82		0.051	1.48	1.41	0.02	0.83

Mann-Whitney test. Pre: pre-implementation score; Post: post-implementation score; Diff: difference in scores post-pre implementation; SD: Standard deviation; ES: effect size.
ACIC components: Part 1, delivery system organization; Part 2, community linkages; Part 3a, self-management support; Part 3b, decision support; Part 3c, delivery system design; Part 3d, clinical information systems; and Part 4, integration of IMCM components.

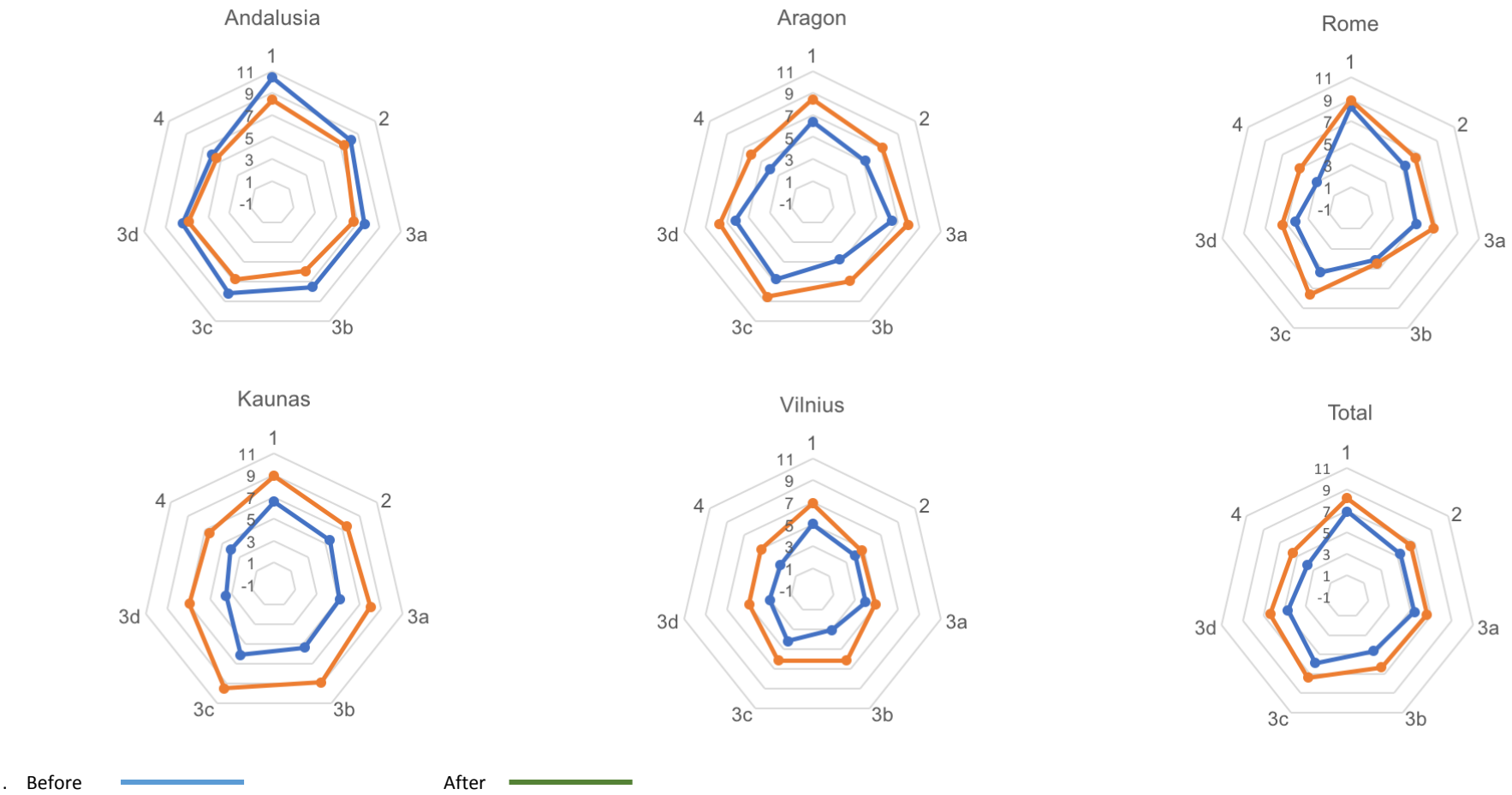


Figure 2. ACIC mean scores before (pre) and after (post) implementation of the Integrated Multimorbidity Care Model (IMCM), by site and total sample.

1. Delivery system organization; 2. Community linkages; 3a. Self-management support; 3b. Decision support; 3c. Delivery system design; 3d. Clinical information systems; 4. IMCM component integration.

PACIC+ results

The baseline total sample was composed of 226 patients. The distribution by sites and its characteristics are displayed in Table 9. In general, women accounted for 52.21% of the total sample, who had a mean age of 62.9 (standard deviation, SD: 17.1; range: 20-93) years. The mean *change score* for the total sample was 4.91 (SD: 1.14) and it ranged from 4.36 (SD: 0.96) for Kaunas to 5.87 (SD: 1.17) for Aragon. More than half (58%) of the total sample reported better care in the last 12 months.

Baseline PACIC+ summary score ranged from 2.91 (SD: 0.96) in Andalusia to 3.90 (SD: 0.78) in Vilnius (Table 10). *Arrange* was the domain with the lowest scores across sites (2.02 in Andalusia to 3.17 in Vilnius), while *advise* had the highest scores (3.20 in Andalusia and Aragon to 4.10 in Vilnius). After the intervention, PACIC+ summary score ranged from 3.46 (SD: 0.97) in Andalusia to 4.55 (SD: 0.35) in Aragon. As in baseline, *arrange* was the domain with the lowest scores in all sites (2.7 in Andalusia to 3.82 in Rome) and *advise* the domain with the highest scores (3.69 in Andalusia to 4.6 in Aragon).

At follow-up, the sample included 210 patients. A significant increase was found in the PACIC+ summary score (Table 10), ranging from 3.25 at baseline to 4.03 after the intervention ($p< 0.001$). PACIC+ domains also increased significantly, with *arrange* being the domain with the highest increase (0.99), although *advise* was the domain that reached the highest score (4.16, SD: 0.75). By sites, the lowest increases were observed in Vilnius (0.09 in *assist* to 0.26 in *arrange*) (Figure 3). The greatest changes were reported in Aragon (all domains except *assist*) and Kaunas (*assist*). Effect sizes ranged from 0.70 (*assist*) to 0.89 (*arrange*), with a value of 0.82 for the summary score.

The regression models of PACIC+ domains and summary score showed that a higher change in PACIC+ was mainly associated with lower scores in corresponding PACIC+ domains at baseline (standardized beta, $\beta= -0.72$ in *advice*, to -0.692 in *assess*, $p< 0.001$) and to a higher change ($\beta= 0.24$ in *agree* to 0.34 in *assess*, $p< 0.001$) in ACIC domain 1 (delivery system organization) (Table 11). A higher change in PACIC+ domains *assess*, *assist,* and *arrange* and in summary score scores was consistently associated with a lower change in domain 4 of ACIC (integration). Changes in PACIC+ scores were not significantly associated with changes in ACIC domain 2, as well as socio-demographic characteristics. The explained variance (R^2) ranged from 0.44 (PACIC+ *assess* model) to 0.55 (*advice*).

Table 9. Socio-demographic characteristics of patients and self-reported change score by implementing site.

		Andalusia (n=52)		Aragon (n=18)		Rome (n=61)		Kaunas (n=50)		Vilnius (n=45)		Total (n=226)	
		n	%	n	%	n	%	n	%	n	%	n	%
Sex	**Man**	25	48.08	10	55.56	33	54.10	18	36.00	22	48.89	108	47.79
	Woman	27	51.92	8	44.44	28	45.90	32	64.00	23	51.11	118	52.21
Civil status	**Single**	3	5.77	0	0.00	48	78.69	1	2.00	2	4.44	54	23.89
	Married/ with partner	34	65.38	12	66.67	11	18.03	24	48.00	35	77.78	116	51.33
	Widowed	13	25.00	5	27.78	0	0.00	13	26.00	3	6.67	34	15.04
	Separated/ divorced	2	3.85	1	5.56	2	3.28	12	24.00	5	11.11	22	9.73
Education	**Primary complete or incomplete**	30	57.69	15	83.33	22	36.07	0	0.00	0	0.00	67	29.65
	Secondary	12	23.08	1	5.56	30	49.18	22	44.00	6	13.33	71	31.42
	University	5	9.62	2	11.11	3	4.92	28	56.00	29	64.44	67	29.65
	Other	5	9.62	0	0.00	6	9.84	0	0.00	10	22.22	21	9.29
Activity	**Employee**	4	7.69	0	0.00	9	14.75	13	26.00	22	48.89	48	21.24
	Housewife	11	21.15	1	5.56	3	4.92	0	0.00	1	2.22	16	7.08
	Unemployed	3	5.77	0	0.00	16	26.23	0	0.00	1	2.22	20	8.85
	Retired	30	57.69	17	94.44	21	34.43	34	68.00	20	44.44	122	53.98
	Other	4	7.69	0	0.00	12	19.67	3	6.00	1	2.22	20	8.85
Change score	**No change or worse (1-4)**	11	26.19	4	22.22	--	--	31	36.00	12	42.86	58	42.03
	Better (5-7)	31	73.81	14	77.78	--	--	19	64.00	16	57.14	80	57.97
		M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Age (years)		72.3	12.9	80.1	9.47	46.7	19.4	68.5	6.44	61.0	9.06	62.9	17.1
Change score (1-7)		5.31	1.14	5.78	1.17	--	--	4.36	0.96	4.75	0.84	4.91	1.14

M: mean; SD: Standard deviation.

Table 10. Mean scores of Patient Assessment of Care for Chronic Conditions (PACIC+) survey subscales and total scale, before (pre) and after (post) implementation, by site.

		Andalusia (n=42)			Aragon (n=18)			Rome (n=60)			Kaunas (n=50)			Vilnius (n=40)			Total (n=210)			
		Mean	SD	p	Mean	SD	p	Mean	SD	p	Mean	SD	p	Mean	SD	p	Mean	SD	p	ES
Assess	**Pre**	2.96	1.14		3.45	0.35		3.28	1.11		3.20	0.93		3.95	0.84		3.34	1.03		
	Post	3.56	1.10		4.58	0.39		4.09	0.76		4.44	0.75		4.05	0.83		4.10	0.88		
	Diff	0.60	0.87	<0.001	1.13	0.39	<0.001	2.02	1.50	<0.001	1.24	0.98	<0.001	0.10	0.54	0.226	0.77	0.96	<0.001	0.75
Advise	**Pre**	3.20	0.91		3.20	1.07		3.28	1.10		3.24	0.95		4.10	0.73		3.42	0.99		
	Post	3.69	0.88		4.60	0.48		4.14	0.66		4.36	0.68		4.23	0.70		4.16	0.75		
	Diff	0.49	1.04	0.004	1.21	0.73	<0.001	0.87	1.05	<0.001	1.12	0.94	<0.001	0.14	0.62	0.177	0.74	0.97	<0.001	0.75
Agree	**Pre**	3.00	1.02		3.41	0.61		3.18	1.06		2.90	1.18		3.87	0.90		3.23	1.07		
	Post	3.54	1.10		4.53	0.39		4.07	0.68		4.09	0.93		4.09	0.77		4.01	0.87		
	Diff	0.53	0.93	0.001	1.13	0.49	<0.001	0.82	1.11	<0.001	1.18	1.24	<0.001	0.21	0.73	0.072	0.78	1.01	<0.001	0.73
Assist	**Pre**	2.48	1.03		2.81	0.68		2.93	1.14		3.20	0.86		3.78	1.04		3.05	1.08		
	Post	3.10	1.02		3.98	0.76		3.94	0.76		4.17	0.76		3.87	0.82		3.82	0.90		
	Diff	0.62	0.92	<0.001	1.16	0.67	<0.001	0.54	1.25	<0.001	0.97	0.93	<0.001	0.09	0.79	0.475	0.76	0.96	<0.001	0.70
Arrange	**Pre**	2.03	1.01		2.20	0.57		2.62	1.15		2.26	1.07		3.17	1.09		2.48	1.11		
	Post	2.70	1.05		3.63	0.94		3.82	0.89		3.71	0.98		3.43	0.88		3.48	1.03		
	Diff	0.66	0.98	<0.001	1.44	0.60	<0.001	0.93	1.29	<0.001	1.45	1.40	<0.001	0.26	0.77	0.040	0.99	1.19	<0.001	0.89

5 As Summary	**Pre**	2.91	0.96		3.38	0.54		3.17	1.01		3.05	0.87		3.90	0.78		3.25	0.95		
	Post	3.46	0.97		4.55	0.35		4.07	0.66		4.23	0.81		4.07	0.75		4.03	0.82		
	Diff	0.54	0.85	<0.001	1.17	0.58	<0.001	0.72	1.05	<0.001	1.19	0.93	<0.001	0.17	0.62	0.093	0.78	0.90	<0.001	0.82

Paired Student's t-test.

Pre: pre-implementation score; Post: post-implementation score; Diff: difference in scores post-pre implementation; SD: Standard deviation; ES: effect size. Missing data on PACIC+ pre, for Aragon: imputed with regression model.

Table 11. Linear regression models of Patient Assessment of Care for Chronic Conditions (PACIC+) domains at post-implementation.

Model		Standardized beta	t	Sig.	95% confidence interval		R^2
Assess	***(Constant)***		*6.085*	*<0.001*	*1.665*	*3.261*	**0.44**
	Assess pre	-0.604	-10.849	<0.001	-0.667	-0.462	
	ACIC1 diff.	0.335	4.220	<0.001	0.107	0.296	
	ACIC4 diff.	-0.212	-2.767	0.006	-0.359	-0.060	
Advise	***(Constant)***		*8.925*	*<0.001*	*2.488*	*3.899*	**0.55**
	ACIC1 diff.	0.266	3.742	<0.001	0.077	0.248	
	Advise pre	-0.716	-14.543	<0.001	-0.803	-0.611	
Agree	***(Constant)***		*7.247*	*<0.001*	*2.015*	*3.522*	**0.48**
	ACIC1 diff.	0.243	3.172	0.002	0.058	0.250	
	Agree pre	-0.658	-12.304	<0.001	-0.717	-0.519	
Assist	***(Constant)***		*6.940*	*<0.001*	*1.844*	*3.307*	**0.46**
	ACIC1 diff.	0.296	3.737	<0.001	0.085	0.273	
	ACIC4 diff.	-0.225	-3.050	0.003	-0.369	-0.079	
	Assist pre	-0.656	-11.762	<0.001	-0.684	-0.488	
Arrange	***(Constant)***		*6.553*	*<0.001*	*2.023*	*3.765*	**0.46**
	ACIC1 diff.	0.287	3.679	<0.001	0.099	0.328	
	ACIC4 diff.	-0.242	-3.283	0.001	-0.476	-0.119	
	Arrange pre	-0.649	-11.836	<0.001	-0.806	-0.576	

5As summary	***(Constant)***		*6.867*	*<0.001*	*1.802*	*3.254*	**0.45**
	ACIC1 diff.	0.299	3.812	<0.001	0.082	0.258	
	ACIC4 diff.	-0.178	-2.333	0.021	-0.306	-0.026	
	5As summary pre	-0.625	-11.270	<0.001	-0.697	-0.490	

Other variables included in the models: sex, age, civil status, education, activity, ACIC2 diff.

Pre: pre-implementation score. Diff.: difference in scores between post- and pre-implementation.

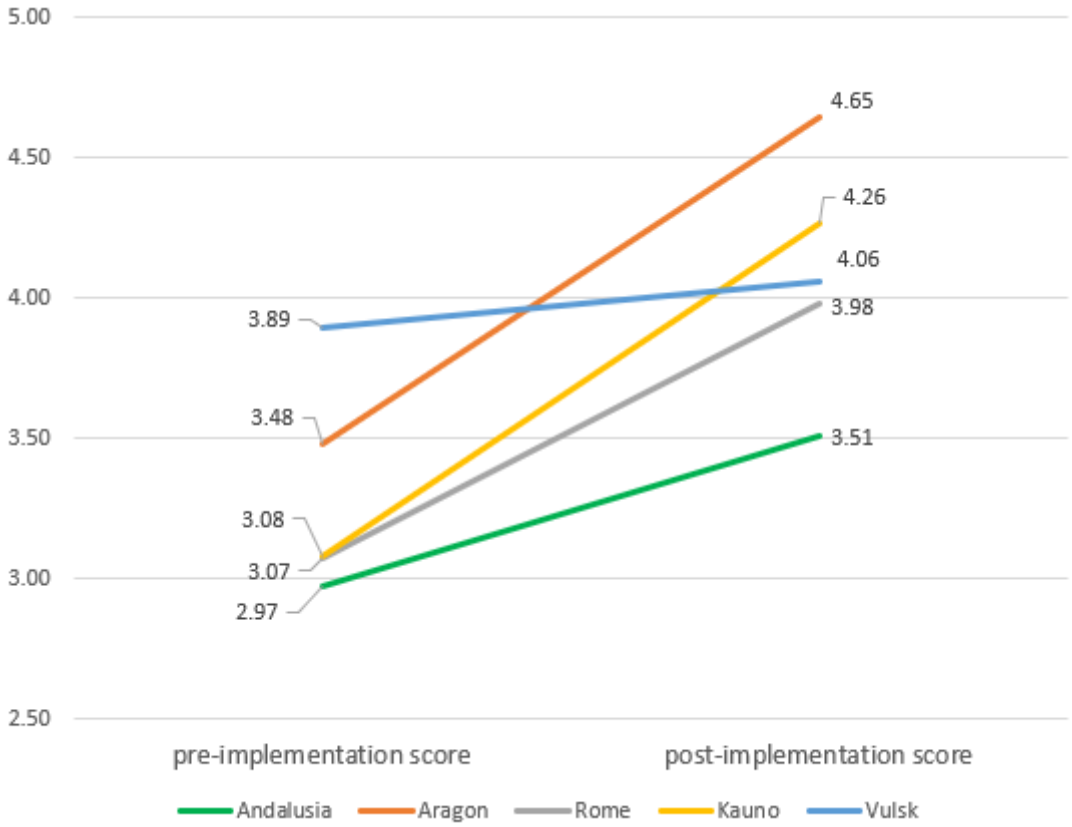


Figure 3. Estimated marginal means of PACIC+ 5As summary score by site and by pre- and post-implementation.

Section 4 - Conclusions

Despite the differences between sites in terms of implemented components of the IMCM and target populations, results of this WP suggest that the IMCM can be successfully adapted to different clinical and local settings. Each of the five sites were able to implement different components of the IMCM to suit their local needs and capacities and the common methodology applied by the local Implementation Working Groups allowed for a standard process that could be comparable between sites and may be applied in future implementations to increase the successful application of IMCM.

In general, the IMCM had positive effect across all healthcare systems in which it was tested. The total ACIC score, which assesses the strengths and weaknesses of delivery of care for chronic illness, increased from 5.23, indicative of basic support at baseline, to 6.71, which represents reasonably good support for chronic illness care and represented a change of large magnitude (effect size=0.83). Further, according to the PACIC+, which quantitatively assesses the outcome of the interventions as perceived by the patients, more than half (58%) of the total sample reported better care in the last 12 months, and there was a significnt increase in in the PACIC+ summary score.

Results from the individual sites suggested that the pilot implementations were successful in a variety of aspects. Some noteworthy examples are discussed here. In Andalusia and Kauno Klinikos, the pilot implementations led to a decrease in different types of healthcare visits, including primary care visits, hospitalizations, and emergency department visits/episodes, In Aragon, healthcare professionals improved their multimorbidity management skills through the online training, with more than 80% of patients reporting an improvement in healthcare after the intervention. In UCSC, there was a decrease in the number of Emergency Department accesses and fewer missed appointments. VULSK, who applied a large number of components from the IMCM in their pilot implementation, reported a significant decrease in the average number of active medical substances used per patient between their first and last medical visits.

The findings of the current WP can be conjunction to results from D6.2, which suggested a review and update of national and local healthcare strategies and plans for care and management of patients with multimorbidity. These considerations should take into account the results of the current WP, which provides examples of how to implement care models in different settings, and how to adapt and apply the different components of the IMCM (such as case manager appointment, individual care plan, multi sectoral patient centered approach).

Based on the current results, IMCM adaptation to local context and pilot scale up is encouraged. In order to improve the IMCM, it might be necessary to futher evaluate the barriers and opportunities related to implementation from the perspective of healthcare professionals and patients. Political debate moderated by Health Ministries at national levels (in all MS) to support the IMCM adaption to local contexts, as well as encourage the scaling up of the practices be organized, with the aim of reducing the burden of chronic diseases. However, more information is needed befor scaling up; particularly an economic evaluation of the impact of scaling up the pilot sites experience is recommended in each MS. The long-term success of the IMCM intervention need to be further assessed and the economic evaluation of IMCM pilot implementation across different size and location stakeholders must be enforced by each MS nationally. Demands of primary healthcare services should be reviewed by each MS and modified considering the findings of the current pilot implementation.

Despite its limitations, this study provides intervention results on the pilot application of the IMCM in five European settings of both primary and specialized care levels, with different characteristics. Results consistently showed an improvement in quality of care from the perspective of the patient, healthcare providers and managers. The results underscore the feasibility and benefits of a comprehensive approach to multimorbidity care. The present study also highlights the need to integrate the IMCM in National Health Systems to lessen the burden that multimorbidity represents for healthcare providers, stakeholders, and patients.

Section 5 - Recommendations/ Lessons learnt

Suggestions for future Implementations, Sustainability and Replicability/Transferability of the *IMCM:*

1. Based on the evidence from D6.2 implementation review and update of national/local Healthcare strategies and plans for care and management of patients with multimorbidity is suggested. In order to ensure quality and sustainability of primary health care it is recommended for each MS to review national health strategy sections for treatment of patients with multimorbidity and complement it relying on science-based methodological pilot implementations (such as case manager appointment, individual care plan, multi sectoral patient centered approach).
2. IMCM adaptation to local context and pilot scale up is encouraged. Political debate moderated by the Ministry of health at a national level (in all MS) to support the IMCM adaption to local context, implementation and encourage the scaling up of the practices, aimed at reducing the burden of chronic diseases should be organized.
3. Economic evaluation of the impact of scaling up the pilot sites experience is recommended in each MS. The long-term success of the IMCM intervention need to be further assessed and the economic evaluation of IMCM pilot implementation across different size and location stakeholders must be enforced by each MS nationally. Demands of primary healthcare services should be reviewed by each MS and modified considering pilot implementation findings.
4. A fine tuning of the IMCM can be proposed by a more pronounced involvement of patients in the development and by a detailed identification and targeting of barriers/opportunities related to implementation

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Appendix

Table 1. Results of pilot implementation in the Region of Andalusia

General Objective (Specific Aim): Better management of complex chronic patients (CCPs) to improve their health status by the systematic application of Personalized Care Plans (PAPs) in Andalusia	**Indicators**			
	Process	**Outcomes**		**Sources of information**
		Baseline	**Current value**	
Specific Objectives: **SO1**: To improve professionals' awareness, knowledge and skills on the management of complex chronic patients **SO2**: Assessment of the systematic application of PAPs to CCPs in primary healthcare centers (PHC) of the Andalusian Public Health System (APHS).		31.7% increment in unplanned potentialy preventable inpatient episodes 2018/2017	Reduction to 16.1% increment in unplanned potentialy preventable inpatient episodes 2019/2018 23.5% reduction in economic impact estimation	
Activities (change package): **SO1**: • Awareness-raising sessions for PHC professionals of the APHS. • Training sessions on CCPs management and PAPs through the OPIMEC2 platform. • Drawing up and delivering the PAPs.	48 awareness sessions held (end 2018) 154 attendees to awareness sessions 4 online training sessions (2019) 2,570 healthcare professional trained (2019).			General Directorate of Healthcare (SAS) OPIMEC 2019 Report.
SO2: • CCPs case selection. • Assessment of Patients satisfaction (PACIC) • Data extraction and analysis.	2,788 patients included and followed in the Andalusian pilot.	31.7% increment in unplanned potentialy preventable inpatient episodes 2018/2017	5.3 PACIC score improvement in perceived health status (2020)	PACIC questionnaires

[2] OPIMEC: Observatory of Innovative Practices for Complex Chronic Disease Management (www.opimec.org)

○ Health outcomes assessment ○ Economic impact • PAP quality assessment.	32 health districts[3] represented in the study. 350 PAP reviewed for QA.	Healthcare service utilisation (2018): 81397 PHC visits; 3841 PHC emergencies; 16048 outpatients visits	Reduction to 16.1% increment in unplanned potentialy preventable inpatient episodes 2019/2018 Reduction in healthcare service utilisation (2019): -6.1% PHC visits; -3.3% PHC emergencies; -3.9% outpatients visits 23.5% reduction in economic impact estimation 4.6% PAP with full quality compliance in QA.	SAS's corporate IS[4]

[3] Total number of health districts: 33
[4] IS: information systems

Table 2. Results of pilot implementation in the Region of Aragon

General Objective To pilot the implementation of the IMCM in the public health system of Aragón (Spain) to improve care for patients over 65 years with multimorbidity.	**Indicators**			
	Process	**Outcomes**		**Sources of information**
		Baseline	**Current value**	
Specific objectives/activities **SO1.** To improve the provision of health care and patient´s self-perceived quality of care. Comprehensive assessment of patients, follow-up and agreed individualized care plans Designation of patients´ case manager Creation of hospital chronic care unit Creation of module for sharing patients´ information Assessment of patients´ self-perceived health care provision (PACIC) Assessment of patients´ with self-perceived improvement in health care provision.	Primary care teams included in the intervention: 21 Patients with individualized care plan: 100% (n=291) Patients with case manager identified: 100% (n=291) Hospital Chronic Care Unit: Yes Module for sharing information: Yes	Hospitalizations/ patient/year: 0.64 Visits to emergency room/patient/year: 1.55 Primary care visits/ patient/year: 49	Hospitalizations/ patient/year: 0.69 Visits to emergency room/patient/year: 1.24 Primary care visits/ patient/year: 42 PACIC summary mean score: 4.55 Patients´ with self-perceived improvement in health care provision: 87.5%	Electronic health records Health Department Interim Report PACIC questionaire Ad-hoc question on self-perceived improvement in health care provision.
SO2. To improve healthcare professionals´ skills on multimorbidity, polypharmacy, person-centred care and shared-decision making. Development of an online 5-week training course	Training material developed: Yes Professionals accepting to do the course: 100%	Pre-course exam score: 7.36/10	Post-course exam score: 9.18/10 Knowledge improvement: 1.82 points	Training course eMULTIPAP Ed. CHRODIS PLUS: eMULTIPAP Training course evaluation report Exam pre-post course

(eMULTIPAP) for health professionals. Assessment of professionals satisfaction/perceived impact of training	Professionals trained: 89.1% (49/55) Professionals satisfaction: 8.3/10		Professional's perceived impact of training: 3.8/5	Ad-hoc questionnaire on impact
SO3. To strengthen the provision of community care. Identification and mapping of community resources Socio-family assessment of patients Referral of patients to social worker if needed	Website with mapped community resources identified: Yes (348) Patients with socio-family assessment: 96.7% Patients referred to social worker:3.3%			Website of community resources available Electronic health records

Table 3. Results of pilot implementation in UCSC

General Objective (Specific Aim): improve Multimorbidity management in elders with dementia and adults with intellectual disability	**Indicators**			
	Process	**Outcomes**		**Sources of information**
		Baseline (2018)	**Current value** (31st Dec. 2019)	
Specific Objectives **SO1**: Improve communication and coordination of care among members of the health care team and patients and assess patients with comprehensive tools **SO2**: To improve services accessibility and efficiency, and merge it also with SO3 **SO3:** Improve patient self-management		KPI1: Patient Assessment of Care for Chronic Conditions (PACIC+) pre-implementation score: 3.2 (61); KPI2: Assessment of Chronic Illness Care (ACIC 3.5) pre-implementation score: 5.05	KPI1: Patient Assessment of Care for Chronic Conditions (PACIC+) post-implementation score: 4 (61) KPI 2: Assessment of Chronic Illness Care (ACIC 3.5) post-implementation score 6.21	PACIC and ACIC Electronic Surveys – Red Cap
Activities (change package) **SO1-** • Identify the role of case manager (goals and protocol) • Identify a multidisciplinary team to be activated on request by the case manager according to subjects' needs • Provide training for case management • Assess Patients with Alzheimer Disease and Down Syndrome with InterRAI-Contact Assessment and InterRAI-Intellectual Disability tools respectively	KPI1: Number of patients kept in charge by the case manager: 265 KPI2: Number of patients assessed with InterRAI tools: 198	KPI3: Emergency Department admission of patient enrolled in the study: 9(3.4%); KPI4: Drop-outs (Missing appointments by patients): 69(26%)	KPI3: Emergency Department admission of patient enrolled in the study: 3 (1.1%); KPI4: Drop-outs (Missing appointments by patients): 5(1.9%)	Hospital Data warehouse; Red Cap data set Atlante dataset

General Objective (Specific Aim): improve Multimorbidity management in elders with dementia and adults with intellectual disability	**Indicators**			
	Process	**Outcomes**		**Sources of information**
		Baseline (2018)	**Current value** (31st Dec. 2019)	
SO2 - • Create a Convenient and Effective techno care work station • Define techno care procedure including eligibility criteria	KPI1: Number of techno visits in 12 months: 105	KPI2: Drop-outs (Missing techno visits by patients): NA KP3: Fully positive responses on the patient satisfaction survey (average of 4 items): NA	KPI2: Drop-outs (Missing techno visits by patients): 0 KP3: Fully positive responses on the patient satisfaction survey (average of 4 items): 79.9%	Red Cap data set Electronic Survey- Red cap
SO3- • Provide group meetings for patients and family members. Topics included natural history of diseases, associated medical conditions and useful tips on symptoms management (especially focusing on behavioral disturbances). Patients' and caregivers' experiences sharing sessions were included.	KPI1: Number of patient attending the group meeting: 13	KP2: Fully positive responses on the patient satisfaction survey (average of 5 items): NA	KP2: Fully positive responses on the patient satisfaction survey (average of 5 items): 56.4%	Red Cap data set Electronic Survey- Red cap

Table 4. Results of pilot implementation in VULSK

General aims of the intervention is to test IMCM applicability in the primary healthcare setting	Indicators			
	Process	Outcomes		Sources of information
		Baseline (2018)	Current value (2020)	
Specific Objectives SO1: To improve professionals' knowledge and capacity in MM patients management and coordination through levels of care SO2: To improve patients' awareness and capacity for self-management SO3: To improve patients' access to services, including community and social resources		1.5 Visits to PHC team/patient/year – **NA** 1.6 Admissions to the emergency room/patient/year – **NA** 1.7Hospitalizations /patient/year – **NA** 1.8: ACIC score – **3.70** 2.4: PACIC+ score – **3.72**	1.5 Visits to PHC team/patient/year – **2.97** 1.6 Admissions to the emergency room/patient/year – **0.22** 1.7Hospitalizations/patient/year – **0.25** 1.8**:** ACIC score – **5.52** 2.4: PACIC+ score – **3.92**	Hospital Data Base Pilot database platform (MIDAS) ACIC and PACIC+ questionnaires
Activities (change package) SO1: • Definition of multidisciplinary team; • Definition of case manager; • Training care providers to tailor self-management support for patients; • Development of individual health care plan template; • Regular communication and internal meetings among Multidisciplinary team members;	1.1: **195** Patients included in pilot 1.2: **100%** patients assigned to a case manager 1.3: Existence of a protocol for a case manager - **YES**	1.4: Drug interaction rate/patient – NA	1.4: Drug interaction rate/patient – **2.46**	Patient holistic assesment forms

S02: • Collection of information on patients' needs and expectations regarding their condition and barriers to care. • Education course for patients on self management; • Establishment of approaches to strengthen patients' self-management and self- efficacy by involving patients in decision-making; • Encouragement for patients to increase health literacy;	2.1: **97.43** % of patients with individualized care plan 2.2: **100 %** of patients underwent comprehensive assessment	2.3: Health status scale score – **0.679**	2.3: Health status scale score – **0.684**	EQ-5D Patients' individual health care plan forms
S03: • Asses MM patients social condition; • Involve social worker in Multidisciplinary, coordinated team for multimorbid patients care; • Support access to community and social resources.	3.1: **130** patients screened for social problems 3.2: Multidisciplinary team meetings with social worker - **YES**	3.3: **43** patient reporting problems in selfcare	3.3: **41** patient reporting problems in selfcare	EQ-5D and Patients' social assesment questionnaires

Table 5. Results of pilot implementation in Kauno Klinikos

	Indicators			
General purpose: To improve the quality of care provided to multimorbid patients in Lithuania by testing Chrodis IMC Model	Process	Outcomes		
		Baseline (2018)	Current value (2020)	Sources of information
Specific Objectives SO1 - To improve patient's continuous assessment, self-management and care SO2: To improve professionals knowledge and capacity for MM patient's management at PHC level		-Nr. ambulatory-primary care visits/year - NA: -to family physicians - 10.7 -to case managers: 0 -to specialists -NA -nr. of hospitalizations/year: NA -nr. of visits to ED/year: NA -PACIC score (2019) - 3.4 -ACIC score (2019)-5.18 - Training program for medical providers involved in MM patients care –N	Nr. ambulatory primary care visits/ year -15,2: -to family physicians -10.7 -to case managers - 4.5 -to specialists - 4,5 -nr. of hospitalizations/year - 0,4 -nr. of visits to ED/year- 0.2 -PACIC improved score - 4,2 ($p<0.05$) -ACIC improved score- 8.04($p<0.05$) -Training program for medical providers involved in MM care at the University - Yes	Hospital e-records Database platform (MIDAS) PACIC Report ACIC Report University Training program

Activities (change package) SO1: -Comprehensive assessment of patients (medical, mental, functional capacities and social problems) -Develop the individualized health care plan -Monitor and evaluate the utilization of health resources/year	-Nr. patients included in pilot -201 (50 rural area; 151 city) -Individualized health care plans elaborated – 201 (100%) -Visits to PHC, specialists, hospitalizations and Emergency Department assessed: Yes -Patients perception of care assessed through PACIC - 201(100%)	-Nr. patients' screened for mental problems (HAD, Mini mental scales) (2019) - 201: -nr. patients' tested for polypharmacy/ incompatible drug-drug interactions (2018): NA	-Nr. patients' screened for mental problems (HAD, Mini mental scales) (2020) - 201: -nr. patients' tested for polypharmacy incompatible drug-drug interactions (2019/2020) – 201 (100%);	Hospital e-records Database platform (MIDAS) Patients holistic assessment forms
SO2 -Establish a Multidisciplinary team; -Design the guidelines for the multidisciplinary team; -Design a protocol for the case-manager; -Regular consultations by multidisciplinary team (support system)	-Developed guidelines for the multidisciplinary team - Yes -Elaborated a protocol for the case manager - Yes - Doctor-to-doctor decision support system established at PHC level - Yes	-nr. patients consulted by multidisciplinary care team/12 months (2019)- 0	-nr. patients consulted by multidisciplinary care team (2020) - 201 (100%);	Multidisciplinary team forms