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CHRODIS+
IMPLEMENTING GOOD PRACTICES FOR CHRONIC DISEASES

Deliverable 6.1

WP6

Pilot Implementation of Integrated Care Model for Multimorbidity

D6.1 Report on preparatory phase and scale up strategy

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Abbreviations

JA	Joint action
CD	Chronic diseases
EB	Executive board
ICMM	Integrated Care Model for Multimorbidity
MM	Multimorbid
EU	European union
SWOT	Strengths, weaknesses, opportunities, threats
WP	Work package
UCSC	Universitá Catolica del Sacro Cuore
VULSK	Viesoji Istaiga Vilniaus Universiteto Ligonine Santaros Klinikos
IACS	Aragon Health Sciences Institute
FPS	Fundación Pública Andaluza Progreso Y Salud
CSJA	Consejería de Salud de la Junta de Andalucía
SAS	Servicio Andaluz de Salud
PAP	Pilot Action Plan

Executive summary

Introduction to JA CHRODIS PLUS

CHRODIS PLUS main purpose is the collaboration of EU countries 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 3 following areas:

1. health promotion & primary prevention (WP5)

2. an Integrated Multimorbidity Care Model, fostering the quality of care for people with chronic diseases (WP6)

3. ICT-based patient empowerment and employment & chronic diseases (WP7)

The present report refers to pilots of the second area.

Aim and scope of the report

This report focuses on preparation process of practical field-testing of the Integrated Multimorbidity Care Model (developed in JA CHRODIS) for people with multi-morbidities in primary care and tertiary care hospitals in Lithuania, Italy and Spain. (5 pilot sites). This report contains description of participating practices and questionnaire used for their evaluation, definition of stratifications strategies and the results of the experts meeting to define implementation strategies as well as tailoring of the intervention for WP6 pilot sites.

Pre-implementation

During the pre-implementation phase each pilot site assembled the local implementing work group (LIWG) to conduct the activitie introduced during a meeting in Treviso - defined the SCOPE and conducted SWOT analysis in preparation for the pilot action plan.

The approach taken to define the implementation of the Integrated Multimorbidity Care Model presented in this report involved several steps based, in particular, on:

- Assessment of participating pilot sites organizational characteristics before the implementation.
- Existing risk stratification strategies revision to identify the strategies that pilot sites apply in the practices.
- Definition of an implementation strategy and tailoring of the intervention.
- Organization of a pre-Implementation workshop that was aimed to define the common methodology and process for the cross-national implementation of pilots.

- Definition of a series of templates on: SCOPE definition, SWOT analysis, identification of improvement areas, pilot plan elaboration, and an individual PILOT ACTION PLAN report adapted to WP6's specific objectives.

Implementation activity

Most relevant WP6 pilot sites' IMCM implementation characteristics:

Aragon Health Sciences Institute (IACS), Spain

The intervention implemented in Aragón aims to address the problem of managing multimorbid complex patients in Primary Care, in close collaboration with Hospital Care. These issues will be addressed by reorienting the provision of health services, adapting the organization of health system to ensure continuity of care through better coordination with hospital services to satisfy the real needs of this population group, and by training healthcare professionals to manage multimorbidity. The main aim is to decrease the impact of multimorbidity on health outcomes, by increasing continuity of care and training healthcare providers in multimorbidity and patient-centred care.

Kauno klinikos, Lithuania

Hospital of Lithuanian University of Health Sciences Kauno clinics is the largest health care institution in Lithuania. Kauno Klinikos will implement the care model in the Family Medicine Department of a tertiary University Clinic located in the second largest Lithuanian city - as the basis for family resident doctors teaching.

The aim is to test the Integrated Multimorbidity Care Model aplication for patients between 40 and 75 years old with multiple morbidities. The pilot implementation will start with the primary health care team training: roles and functions delegation for the team members, long lasting patient's care planning including individual approach to patient continues care needs.

Andalusian Health Service (SAS), Spain

The general purpose of the pilot intervention Andalusia is to assess of the application of individualized care plans in multimorbid patients, within the framework of the Andalusian Public Health System.

The pilot is implemented in Primary Healthcare Centres of SAS. Primary Healthcare is the first level of access for citizens and is the backbone of the Andalusian Public Health System. It provides patient-centered comprehensive healthcare including preventive, treatment and rehabilitation services as well as health promotion, health education and epidemiologic surveillance.

Vilnius University Hospital Santaros Klinikos, Lituania

General purpose of the interventions is to test the Integrated Care Model for Multimorbidity in Lithuania. Based on local experience and knowledge determine country specific model version, fully adapted and specified for further local implementation. The pilot is going to be

implemented in Family Medicine Center - primary care setting at Vilnius University Hospital Santaros Klinikos. Vilnius University Hospital Santaros Klinikos is one of the largest University hospitals in Lithuania, where secondary and tertiary care of specialists and in-patient care - hospitalization is available. Implementation in Vilnius targets the heavy users of the healthcare system. The specific aim of this pilot study is to improve the quality of life, patient satisfaction, decrease the number of potentially avoidable hospitalizations and optimize treatment. Implementation results may be relevant to national policy makers and could be referred to when reshaping the integration between social and health care.

Catholic University of the Sacred Heart, Italy

The "Multimorbidity Care Model in elders with dementia and adults with intellectual disability" programme is led by the Department of Geriatrics of the Università Cattolica del Sacro Cuore in Rome. It is aimed at ageing frail patients with disability, comorbidity/multimorbidity and cognitive impairment. The aim of the pilot study is to improve case coordination and provide patients with a reference care provider. The practice/programme also supports self-management among patients and families. They are informed about the development of the programme and decision-making processes. E-health services are used to exchange information on treatment and care between the care provider and the patient. Patient associations use electronic systems for registering and monitoring the care processes. Finally, evaluation of complex patients is standardized through the routine use of comprehensive geriatric assessment tools.

Conclusions

The pilot implementation is a key step in exploring feasibility of the intervention, to identify modifications needed for its application on a larger scale and to estimate size of the effect on given outcomes. The intervention will be performed on an overall number of 1000 patients, an overall sample size with power enough to detect statistical significance. Sample sizes might vary across implementing sites depending on setting, risk stratification strategy adopted and outcomes assessed.

In the preparatory phase the pilot sites most relevant organizational characteristics participating in the implementation were assessed. Despite differences in implementation, type of funding, and other aspects, there is a shared knowledge base and methodological implementation strategy. This aspect encourages the possibility to implement a common model for multimorbidity across European countries and regions.

An adapted version of the Standards for QUality Improvement Reporting Excellence (SQUIRE 2.0) guidelines will be used to report the whole implementation study in each region from both implementation process and intervention effectiveness perspectives to enhance the evidence base and transferability potential.

1. Introduction

Chronic diseases are highly heterogeneous, cluster into multi-morbidities, affect elderly patients in particular and are associated with frailty. It has been estimated that chronic diseases cost EU economies 115 billion € or 0.8% of GDP annually, and this figure does not include the additional loss in terms of lower employment rates and productivity of people living with chronic health problems. In addition, multi-morbid patients with complex health needs consume up to 74% of total healthcare resources[1].

Improvements in health across the population depend largely on large-scale scale-up of interventions that have proven effective in controlled research settings. CHRODIS-PLUS, during its 36 months of operation, aims to support Member States through the implementation of cross-national policies and practices with demonstrated success to reduce the burden of CD identified in JA-CHRODIS, and in its outputs such as the Integrated Multimorbidity Care Model or the Recommendations for Diabetes Quality criteria or national plans.

The objective of Work Package (WP)6 Pilot Implementation of Integrated Care Model for Multimorbidity is to test the Integrated Care Model for Multimorbidity developed in JA CHRODIS (2014-2017)[2]. It aims to be a framework for care of patients with multimorbidity that potentially could be applied across Europe[3]. Sixteen components across five domains are included in this framework; Delivery of Care, Decision Support, Self-Management Support, Information Systems and Technology and Social and Community Resources.

However, this Integrated Care Model for Multimorbidity (ICMM) developed by JA-CHRODIS needs to be assessed in practice, proving the applicability, adjusted for easier local replicability and validated across different European healthcare settings. To that mean, five pilot sites across three European countries will test it in their local settings.

The purpose of this document is to report on the preparatory phase of the WP6 pilot sites participating in the implementation.

The tasks that have been performed during the preparatory phase are:

- Chapter 1 introduces the JA CHRODIS PLUS, the WP6 and the deliverable D6.1 - Report on preparatory phase and scale up strategy.
- Chapter 2 describes the pilot sites and the assessment of the programmes participating in the implementation
- Chapter 3 provides a description of WP6 pilot site's Risk stratification strategies
- Chapter 4 explains the Implementation strategy developed in JA CHRODIS PLUS in order to standardise the programmes' implementation.
- Chapter 5 presents the Pilot Action Plans of the five programmes

The outcomes of this deliverable will feed directly into the task 6.2 Pilot implementation and outcomes evaluation.

[1] Marengoni, A., Angleman, S., Melis, R., Mangialasche, F., Karp, A., Garmen, A., & Fratiglioni, L. (2011). Aging with multimorbidity: a systematic review of the literature. Ageing research reviews, 10(4), 430-439.
[2] http://chrodis.eu/wp-content/uploads/2017/11/ja-chrodis-multimorbidity-care-model-wp6-rokas-navickas.pdf
[3] Palmer et al. Health Policy 2018

2. Description of participating pilot sites

Five pilot sites from three different countries participate in WP6 –Pilot implementation of Integrated Care Model for multimorbidity. Each of them will implement interventions aimed at multimorbid persons with complex health needs.

"Implementation of a 'Personalized Action Plan' within the Strategy and the Comprehensive Plan for complex chronic patients" in Region Andalusia, Spain:

CSJA will implement the ICMM in primary care in the Andalucía region of Spain. This implementation will be linked with the Healthcare Strategy for Complex Chronic Patients, within the framework of the Andalusian Integrated Healthcare Plan for Patients with chronic diseases. The Andalusian Plan is centred in enhancing community care (primary healthcare), intra-level coordination and continuity of care (liaison nurse).

"Aragon Primary Care" in Region Aragon, Spain:

IACS will implement the ICMM in primary care in the Aragón region of Spain. A group of four general practitioners with more than 20 years of experience in primary care, health research, and training of general practitioners will be in charge of the implementation process. Once selected, they will choose multimorbid patients from their respective practices to carry out the implementation of the model in a real context.

"Multimorbidity Care Model in elders with dementia and adults with intellectual disability" in a Day Hospital Outpatient Clinic in Rome, Italy:

UCSC will implement the ICMM in a tertiary care hospital, the Fondazione Policlinico Universitario Agostino Gemelli Hospital. This hospital is part of the National Health Service as a hospital of national relevance at high specialisation and 1559 Beds. It has developed and implemented Personalized organisational and management models to deliver more effective, efficient and personalised health services through Innovative Integrated Care pathways which involve relevant stakeholder of the territory (vertical and horizontal integration). The Clinical Government Unit will be mainly involved in this project together with the dedicated centre for ageing medicine - Centro Medicina dell'Invecchiamento (CEMI).

"Kauno Klinicos" in the Kauno clinics Primary health care centre and Kaltinenai primary helath care centre, Lithuania:

Kauno Klinios at LUHC will implement the care model in the Family Medicine Department of a tertiary University Clinic located in the second largest Lithuanian city - as the basis for family resident doctors teaching. There are 13 000 of patients on the clinic list, being the majority of patients above 50 years old. It provides all scope of primary care services and is in close relations with other health sectors: secondary and tertiary as well. All physicians are involved in research and teaching process.

"Family Medicine Center, Primary Care" in Family Medicine Center-Primary Care setting at Vilnius University Hospital Santaros Klinikos, Lithuania:

VULSK will implement the care model in primary care. The pilot would test its applicability in the primary healthcare setting, testing the components of the care model, including the case

manager and the others. The implementation will expand beyond the primary care setting, to include the secondary and tertiary care physicians, aiming to create teams, managing the patient. VULSK has well developed an ICT system which will also be included in the care model pilot. Once proven the concept, we will consider rolling it out to other VULSK hospitals outside Vilnius.

2.1 Pilot sites' programmes information

The objective was to assess programmes participating in the implementation, in order to identify and assess their most relevant organizational characteristics before the implementation of the Integrated Care Model for Multimorbidity. A questionnaire to gather information about WP6 pilot sites' programmes was jointly created by WP6 partners.

Information of the practices or programs was collected in six dimensions:

- General information
- Delivery of care and decision support
- Patient self-management
- E-health
- Community resources
- Practice/Program Assessment

The preparation of the questionnaire started in January 2018. A first draft was prepared by UCSC, and then sent to all partners and Advisory Board members to collect their comments and suggestions. The final version of the questionnaire was produced in February 2018.

An online version was made accessible to partners in month 6 of the project (February 2018). The template of the questionnaire is included in Annex I.

All 5 pilot sites participating in WP6 all sites completed the survey by the end of March 2018. Detailed responses from all the mentioned programmes are presented in Annex II.

The five pilot sites' programmes most relevant information is presented below:

CSJA. Personalized Action Plan' within the Strategy and the Comprehensive Plan for complex chronic patients

The "Implementation of a 'Personalized Action Plan' within the Strategy and the Comprehensive Plan for complex chronic patients" programme is led by the Regional Ministry of Health of Andalusia and the Andalusian Health Service. It is aimed at frail patients with comorbidity/multimorbidity status.

The main objectives of the programme are:

- Reducing inequalities in access to care and support services
- Increasing multi-disciplinary collaboration
- Improving patients and informal carers involvement
- Improving functional status (preventing or reducing functional disability)
- Decreasing / delaying complications
- Reducing hospital admissions and emergency/acute care visits

Care providers involved in the practice are from primary care (General Practitioner (GP) and GP Nurse), specialised care (case manager/specialist Nurse, Internist), eHealth centers, social sector and informal carers[4]. Patients are identified from primary care, being the medical doctor the care coordinator.

The practice/programme supports self-management among patients and families. They are informed and involved in the development of the programme and decision-making processes. Professionals are trained to provide self-management support.

E-health services are extensively used, not only for registering and monitoring patients, but also to communicate with patients and among professionals. All care providers have also access to the Electronic health records.

In this programme, the quality of care, the patient-related outcomes and the care utilization/costs will be assessed.

IACS. Aragon Primary Care

The "Aragon Primary Care" programme is led by the Health Department of Aragón and aimed at all citizens of the Aragón region.

The main objectives of the programme are:

- Promoting evidence-based practice
- Reducing inequalities in access to care and support services
- Preventing or reducing misuse of services
- Increasing multi-disciplinary collaboration
- Decreasing morbidity

Care providers involved in the practice are primary care physicians and nurses, physiotherapists and social workers. Patients are identified from primary care, being the medical doctor the care coordinator. Medical care providers have access to the Electronic health records.

In this programme, care utilization/costs will be assessed, including healthcare costs and hospitalisations.

Survey's detailed responses from this programme are presented in Annex III.

UCSC. Multimorbidity Care Model in elders with dementia and adults with intellectual disability

The "Multimorbidity Care Model in elders with dementia and adults with intellectual disability" programme is led by the Department of Geriatrics of the Università Cattolica del Sacro Cuore in Rome. It is aimed at ageing frail patients with disability, comorbidity/multimorbidity and cognitive status.

The main objectives of the programme are:

- Improving professional knowledge on multimorbidity
- Reducing inequalities in access to care and support services
- Improving accessibility of services

[4] Includes family, Friends and unpaid carers

- Improving care coordination and integration of different units (within the organization)
- Increasing multi-disciplinary collaboration
- Identifying target group patients
- Improving patient and informal carers (e.g. family, friends, neighbours and/ or volunteers) involvement
- Reducing hospital admissions and emergency/acute care visits

Care providers involved in the practice are mostly specialists (specialist nurse, cardiologist, pneumologist, endocrinologist, internist, etc.), occupational therapist, physiotherapist, ambulatory health workers and the eHealth center. Patients are identified from the acute hospital, being the medical doctor the care coordinator.

The practice/programme supports self-management among patients and families. They are informed about the development of the programme and decision-making processes. Professionals are trained to provide self-management support.

E-health services are used to exchange information on treatment and care between the care provider and the patient. Patient associations use electronic systems for registering and monitoring the care processes.

In this programme, the quality of care and patient-related outcomes will be assessed.

Kauno Klinicos

The "Kauno Klinicos" programme is led by Kauno Klinicos in Lithuania. It is aimed at ageing patients with comorbidity/multimorbidity status.

The main objectives of the programme are:

- Promoting evidence-based practice
- Improving accessibility of services
- Preventing or reducing over-use and misuse of services
- Improving care coordination, integration of different units (within the organization)and integration of different organizations
- Increasing multi-disciplinary collaboration
- Identifying target group patients
- Improving patient involvement
- Reducing health care costs

Care providers involved in the practice are from primary care (GP, GP Nurse) and specialised care (case manager/specialist nurse, Cardiologist, Pneumologist, Endocrinologist and social worker and psychiatrist upon the needs). Patients are identified from primary care, being the Nurse the care coordinator.

The practice/programme supports self-management among patients/representatives and families, being the GPs and GP Nurses the ones in charge of providing the self-management support.

E-health services are used for registering and monitoring patients and to communicate among professionals. Only relevant medical care providers have access to the Electronic health records.

In this programme, the quality of care, the patient-related outcomes, care utilization/costs, quality of life, polypharmacy and psycho social aspects will be assessed.

VULKS. Family Medicine Center, Primary care

The "Family Medicine Center, Primary care" programme is led by Vilnius University Hospital Santaros Klinikos in Lithuania. It is aimed at citizens attending to the primary care setting.

The main objective of the programme is to promote evidence-based practice to primary care patients.

Care providers involved in the practice are from primary care (GP and GP Nurse). Patients are identified for integrated care services through GP criteria, being the GP the care coordinator.

E-health services are used for referrals. Only relevant medical care providers have access to the Electronic health records.

2.2 Main findings

The information collected through the questionnaire has allowed the identification of some the principal features of programmes participating in WP6. The answers were intended to be used to map existing Integrated Care Models for Multimorbidity at the European level, not to examine the performance of policies or programs of a country, not to rank countries according to their policies and programs, or as a benchmarking tool.

It is interesting to note that pilot sites share common goals; increasing multidisciplinary collaboration, promoting evidence-based practice and reducing inequalities in access to care and support services.

Most of the implementers consider important the involvement of general practitioners and nurses in the delivering of care to patients admitted to the programme/practice. Indeed, the programs are focused mainly around primary care. The majority of patients are identified via primary care setting. In all cases, the main care providers are GP physicians/nurses or alternatively they are involved in the multidisciplinary meetings. Social workers are also a commonly reported key member of the multidisciplinary team, and case managers are appointed in the majority of interventions (usually a physician).

One notable result is that although all programs undergo comprehensive assessment at the start and at the end of the integrated care process, none of them currently undertake a periodic assessment in-between.

An important finding is the high level of agreement in answers given to the questions aiming to investigate the presence of pre-stablished criteria for case evaluation. The service should be delivered to the patient and the presence of digital health care communication tools.

Most of the programs reported some key common characteristics of the intervention and services; patient education, follow-up visits, and referrals between medical specialties being reported in all surveys, and clinical (diagnostic/monitoring) tests are included by 80%.

Technology appears to be a prevalent feature, with 80% offering E-Health services and half of multidisciplinary team meetings are conducted virtually. All participants report using digital health care communication tools (mostly e-referral, but also other aspects like virtual conferences with patients and online appointment schedules). Three quarters have electronic systems for registering/monitoring care processes and all use Electronic Health Records. However, currently none of the programs current use electronic decision support systems.

Finally, an important common absent feature is the support of assess to community and social resources; only 20 % report this, specifically contact with patient associations.

The findings suggest that in spite of the differences in implementation, type of funding, and other organizational/implemental aspects, there is a shared sound knowledge base, leading these programs to be similar in their main constituent and clinical elements. This aspect is encouraging with respect to the possibility to implement a common model for multimorbidity across European countries and regions.

3. Patient risk stratification strategies

Risk stratification strategies and methodologies have been reviewed. WP6 pilot's strategies have been described based on assessment frameworks two previous European projects; ASSEHS[5] and ACT@Scale[6].

3.1 Approach to Risk stratification

Health and care systems are often organised around services that focuses on single diseases and advanced technology, rather than putting individuals at the centre of care and support. This is partly due to the reactive and fragmented way in which care is nowadays delivered. In these circumstances, there is a risk of care not being coordinated and of complications arising, for example, through drug interactions resulting from polypharmacy and leading to avoidable hospitalisations[7].This also does not promote consideration of people's needs in their totality or the most effective use of available resources.

Care coordination should be focused on patients who will benefit most, maximizing the impact on both quality and costs. A worldwide debate on the efficiency of primary health care is attempting to re-orientate health systems and to optimise costs[8]. One of the initiatives to improve the care of people with chronic illnesses is based on the identification of high-risk patients and on adapting care processes to the differentiated needs of each patient.

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 a particular intervention or suite of interventions; consists of grouping the population with different risk levels and needs. It is based on how likely people are to use services. Risk stratification allows identifying who, within each segment, has the greatest risk of needing intense care and greater health resources[9].

Once these individuals have been identified, they can then be monitored. Risk stratification also allows an increase in detection rates and the identification of practices where improvement is necessary. Stratifying populations or individuals who may benefit from a customized intervention is a prerequisite of care pathways.

There are different ways to identify and/or group patients according to their risk of developing future problems. Descriptive and predictive models:

1. Descriptive models:
    - Based on CLINICAL CRITERIA, on clinical decision. It is used to identify individuals who may benefit from an early intervention, and is based solely on the training, knowledge, instinct and experience of the clinician.

[5] http://assehs.eu/
[6] https://www.act-at-scale.eu/
[7] Al Hamid A, Ghaleb M, Aljadhey H, Aslanpour Z. A systematic review of hospitalisation resulting from medicine-related problems in adult patients. Br J Clin Pharmacol 2014;78(2):202–17.
[8] Rapport sur la sante´ dans le monde : Les soins de sante´ primaires : maintenant plus que jamais; 2008, http://www.whoint/whr/2008/fr/indexhtml.
[9] https://www.england.nhs.uk/ourwork/part-rel/transformation-fund/bcf-plan/bcf-archive/tech-toolkit/

- Based on DESCRIPTIVE MODELIZATION: a method based on rules, thresholds of certain parameters or pre-established decision criteria that describe a high-risk patient and are not based on statistical models.

2. Predictive models:
   - Predictive models use statistical formulas and methods to seek to establish relationships between sets of variables, such as age, gender, clinical information, diagnosis, living conditions, district of residence to predict future outcomes. Most use regression models, although methods based on artificial intelligence are increasingly being studied.
   - One of the advantages of predictive models over clinical criteria or descriptive models is that it does not require direct contact between professional and patient. Uses previously recorded data, and can thus be applied to large population groups.

Risk stratification tools are predictive models applied in the healthcare domain to predict future events at clinical and administrative levels. They have two main utilities:

- To anticipate the care of those groups of patients who are more susceptible to the clinical course evolving positively by intervening on them.
- Better planning and efficient management of resources, as well as better distribution of budgets or funding. Adjusting the distribution of resources to the risks allows there to be a direct proportionality with the disease burden of the respective population.

That is, stratifying the population offers the opportunity to act proactively, designing specific health care interventions and also appropriate to the level of need of different groups of people.

According to the predicted outcome and its application, one might define different groups of models[10]:

- Models deployed for “case finding”, that aim at identify top high-risk, high-need or high-cost patients, usually patients located above the 95th or 99th percentile. Those patients are then assigned to tailored programs designed to prevent the adverse event predicted by the RS. An additional approach comprises the stratification of the entire population according to the RS’s outcome.
- Risk adjuster tools, which are used to adapt insurance premiums, payment for healthcare plans, healthcare reimbursement, etc., to reflect the health status of plan members11.
- Models to steer capital investments predicting the future needs of a population in terms of facilities (e.g. hospital beds), services and instruments or for regional / organizations’ comparisons.

Predictive risk stratification models are composed of the mathematical algorithm that calculates the risk for each patient. The algorithm is generally based on multiple regression models, although

[10] ASSEHS White paper

[11] Winkelman, R., & Mehmud, S. (2007). A comparative analysis of claims-based tools for health risk assessment. *Society of Actuaries*, 1-70.

sometimes neural networks or decision trees are used. The mathematical algorithm used will depend on the available information (input) and the information to be predicted (output).

Data used by the risk stratification models are clinical data from administrative databases and the interconnection of registers from the different healthcare and social spheres have facilitated the exploitation of clinical information on the patient. The availability of information and its reliability are determining elements of the explanatory variables that can be introduced in the model.

Data used in the model can be:

- Demographic variables, such as age and sex.
- Previous use of resources, such as hospital admissions, emergency visits, primary care consultations, etc.
- Pharmacy variables, such as pharmaceutical prescriptions and pharmacy costs.
- Morbidity data, such as categorised diagnoses classified in ACGs or EDGs.
- Variables such as state of health, quality of life and health care received.
- Socio-economic variables, such as the deprivation index of the census section of residence.

All of these will be used to generate a prediction. It is evident that the quality of the data on which a predictive model is built and executed will have an impact on the quality of the predictions generated.

The higher the quality of the data (input), the better the predictive model and, consequently, the greater the impact on the quality of its prediction (output).

Among the best-known predictive modelling tools are the "Adjusted Clinical Groups Predictive Model (ACG-PM)", the "Diagnostic Cost Groups (DCG)" and the Clinical Risk Groups (CRG).

All three were designed in the USA and, from a statistical point of view, are robust and versatile systems in their applications. Their usefulness has been proven in public and private health organizations for several years. These models manage to explain an important part of the variability in the use of health services that a population will carry out and offer a prospective estimate of the volume of health resources, for each individual, which will be required the following year.

Adjusted Clinical Groups. Developed by Johns Hopkins University, the ACG is a classification system based on administrative diagnosis data to measure morbidity[12]. Was developed to predict the use of medical resources in inpatient and outpatient services over a specific period of time, using data from diagnoses, along with age and gender, to classify patients into one of 94 categories. ACG can be used to improve accuracy and fairness in forecasting healthcare

[12] Weiner JP, Starfield BH, Steinwachs DM, Mumford LM. Development and application of a population-oriented measure of ambulatory care case-mix. Med Care. 1991;29(5):452-472.

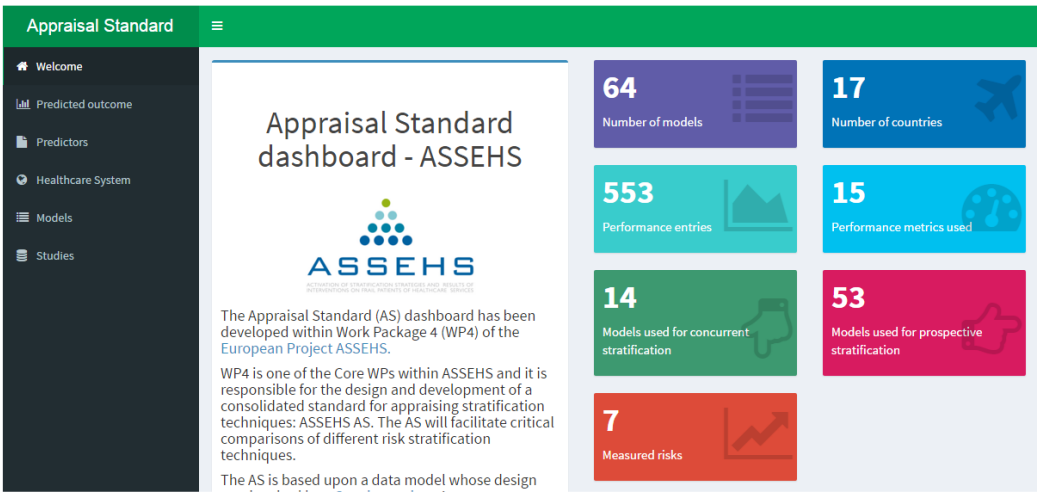
utilization[13] and have been found to predict inpatient hospitalizations as well as or better than other case-mix tools in many health systems[14].

Diagnostic Cost Groups (DCG). Created by Boston University's researches, The DCG model is a diagnosis-based risk assessment model. Includes a number of variations depending on descriptive variables (age, sex, diagnoses, prescriptions, costs) populations and the purpose of the model (predictions on costs, hospital admissions, pharma costs, etc.).

Clinical Risk Groups (CRG). The 3M Clinical Risk Groups (CRGs) are a population classification system that uses inpatient and ambulatory diagnosis and procedure codes, pharmaceutical data and functional health status to assign each individual to a single, severity-adjusted group. Each 3M CRG represents a clinically meaningful group of individuals who require similar amounts and types of resources. 3M CRGs can be used both to predict future healthcare utilization and cost (prospective) and explain past healthcare utilization and cost (retrospective).[15]

There are also European models, for example: GMAs, PARR, SPARRA and CARS. Some of these focus on making predictions about avoidable hospitalizations or hospitalizations.

The ASSEHS Appraisal Standard (AS)[16], developed in the ASSEHS project, facilitates comparisons among different RS models. Contains different tabs each of which allows the user to refine the selection of the information from AS knowledge base according to specific criteria (uses the classification of healthcare systems proposed by Böhm and colleagues[17]). This tool can provide meaningful insights to policy makers and health care managers towards a broader integration of RS tools in European health care systems.



[13] The Johns Hopkins University. About the ACG system. http://www.acg.jhsph.org/index.php?option=com_content&view=article&id=46&Itemid=366. Accessed March 23, 2012.
[14] Lemke KW, Weiner JP, Clark JM. Development and validation of a model for predicting inpatient hospitalization. Med Care. 2012;50(2): 131-139.
[15] https://multimedia.3m.com/mws/media/765833O/3m-crgs-measuring-risk-managing-care-white-paper.pdf
[16] http://assehs.eu/news/appraisal-standard-dashboard.html
[17] Böhm, K. et al., 2013. Five types of OECD healthcare systems: Empirical results of a deductive classification. Health Policy, 113(3), pp.258–269.

Figure 1– Welcome page of ASSEHS AS dashboard.

Planning a risk stratification approach is iterative. The following steps maybe useful[18]:

- 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 standarised set of risk predictors.
- Select individuals, to match their needs to the most appropriate integrated care interventions, and envisage resources needed.

These iterations are interdependent and will be influenced by factors such as availability of reliable electronic data, availability of resources for identification and selection, and capacity for refinement based on monitoring and evaluation of outcomes. It is important to be clear about what it is wanted to predict and to ensure that risk prediction is embedded within a coherent strategy.

To implement a Risk stratification strategy, high-quality operational plan establishing the agenda and the strategic goals and objectives for the years to come is needed. Having trained people qualified in RS is necessary[19]. The clinicians' commitment is a *sine qua non* requirement. Since the clinical group consists of different profiles, a multidisciplinary team should lead the RS deployment[20]. Appropriate ICT is also crucial.

The selection of a model highly depends on the data sources available. This aspect can considerably reduce the number of models on the market suitable for the selected scenario. Also other aspects such as associated costs, license or training of personnel have a great influence on the choice of the model: one can either choose one from the market, freely available or under license, or develop a new model. In the latter case, higher predictive performances are expected but one has to assume to have domain experts in the organization.

On the other hand, one can think of another approach where first a proprietary model is purchased to acquire knowledge in the field. In a second phase, the lessons learnt in the previous step can be capitalized on and an in-house model can be designed to adapt it to the present scenario.

An important aspect of RS models is represented by the predictive performance, that is, how accurately the model predicts the outcome. A performance assessment allows not only to compare different models in terms of their predictive accuracy but also to compare the performance of the selected model in different settings.

[18] Patient identification and selection handbook NSW guide to risk stratification. NSW Agency for clinical innovation

[19] Johns Hopkins risk tool used in South [Internet]. [cited 2016 Apr 21]. Available from: http://www.digitalhealth.net/news/27490/johns-hopkins-risk-tool-used-in-south

[20] Hoult J, Matheson H. Long-term conditions. Spot future patients to find tomorrow's savings. Health Serv J. 123(6340):26, 28.

Ethical issues may arise when deploying RS including that should be faced. Diverse solutions will be required to protect individual and societal interests but a balance could be reached through well deliberated healthcare policies.

3.2 Pilot sites' Risk stratification strategies

Pilot sites' Risk Stratification strategies were analysed focusing on description, identification and selection of patients. A dedicated survey to collect information was developed, based on the European projects ASSEHS and ACT@Scale. Five key dimensions were assessed.

1) Existence of a formal risk stratification approach used to identify and select of patients

Formal risk stratification approach is understood as a systematic process to target, identify and select patients who are at risk and who are expected to benefit most from a particular intervention or suite of interventions. Identification and selection of patients can be done at individual or population levels or both.

2) Patients´ identification and selection criteria

Risk stratification approach used to formal targeting, identification and selection of patients, can be based on:

- Clinical criteria: Based on the clinician training, knowledge, instinct and experience.
- Descriptive method: rules-based thresholds for certain parameters or pre-established decision criteria that describe a high-risk patient (> 65 years, COPD, one previous admission).
- Predictive tool: It is based on predictive models that seek to establish relationships between sets of variables to predict future outcomes, events or healthcare expenditure, using statistical and machine learning methods.
- Mixed method: 3 and 1

3) Case selection. Program selection inclusion and exclusion criteria

Programs have different inclusion and exclusion selection criteria.

4) Case evaluation: variables taken into account to assess specific patient´s needs

Different variables can be taken into account to assess specific patient´s needs either individually or grouped:

Diagnosis, severity, patient-level clinical requirements and specific characteristics (functional health status, pain, social/emotional support, activities of daily living, frailty, cognitive status and others)

5) Approach used to identify, and select patients.

Patients can be stratified by means of an individual clinical assessment or by population risk stratification. In both cases, the result can be: Case Identification of potential candidates, Case selection Inclusion into the program and/or Case evaluation (characterization and assessment of clinical requirements).

The two strategies that used population RS model were further analysed using the ASSEHS project's Appraisal Standard framework.

All pilot sites filled in the excel file with information on their RSS. The information is presented in tables below:

CSJA. Implementation of a 'Personalized Action Plan' within the Strategy and the Comprehensive Plan for complex chronic patient

INDICATOR 1: EXISTENCE OF A FORMAL RISK STRATIFICATION APPROACH USED TO IDENTIFY AND SELECT OF PATIENTS
Individual level
INDICATOR 2: PATIENTS´ IDENTIFICATION AND SELECTION CRITERIA
Descriptive method: rules-based thresholds for certain parameters or pre-established decision criteria that describe a high-risk patient
INDICATOR 3. CASE SELECTION. PROGRAM SELECTION INCLUSION AND EXCLUSION CRITERIA
Inclusion criteria: complex chronic patients that meet, at least, one the following criteria: • Multimorbid patients: patients with chronic diseases included in, at least, 2 of the following categories: a) Heart failure NYHA class II; Ischaemic heart disease b) Vasculitis and systemic autoimmune disease; Chronic kidney disease (glomerular filtration rate < 60 ml/min or albumin-to-creatinine ratio > 30 mg/g) c) Chronic respiratory disease (MRC grade 2 dyspnoea or FEV1 < 70% or oxygen saturation ≤ 90) d) Inflammatory bowel disease; Chronic liver disease with hepatocellular failure or portal hypertension symptoms e) Stroke; Neurological disorder with permanent motor deficit (Barthel index < 60); Neurological disorder with chronic cognitive impairment (Pfeiffer ≥ 5 or MMSE < 23) f) Symptomatic peripheral artery disease; Diabetes mellitus with proliferative retinopathy or symptomatic neuropathy. g) Chronic anaemia due to gastrointestinal bleeding or acquired blood diseases with no curative treatment with haemoglobin level < 10g/dL measured in two separate determinations over three months; Active solid or haematological neoplasm with no curative treatment. h) Chronic osteoarticular diseases that limit safe patient movements; Osteoporotic hip fracture. • Patients suffering chronic diseases included in 1 of the above categories and meet 1 of the following complexity criteria: a) Severe mental disorder (schizophrenia, manic-depressive psychosis, major depression). b) Extreme polypharmacy (active ingredients as chronic prescription ≥ 10).

c) Socio-family risk (Gijón scale score > 10 points).
d) Stage II (or higher) pressure ulcers.
e) Delirium (currently or in previous hospital admissions).
f) Malnutrition (BMI <18.5).
g) Tube feeding as chronic prescription (for 3 or more months).
h) Hospital admissions in the previous 12 months ≥ 2.
i) Alcoholism.

Exclusion criteria (and final limit): End-of-life situation

INDICATOR 4. CASE EVALUATION: VARIABLES TAKEN INTO ACCOUNT TO ASSESS SPECIFIC PATIENT´S NEEDS

Diagnosis + severity + patient-level clinical requirements + specific characteristics (functional health status, pain, social/emotional support, activities of daily living, frailty, cognitive status and others)

INDICATOR 5: LEVEL/S USED TO IDENTIFY, AND SELECT PATIENTS.

	Case Identification of potential candidates	Case selection Inclusion into the program	Case evaluation Characterization and assessment of clinical requirements
Individual clinical assessment	Yes	Yes	Yes
Population risk stratification			

IACS. Aragon Primary Care

INDICATOR 1: EXISTENCE OF A FORMAL RISK STRATIFICATION APPROACH USED TO IDENTIFY AND SELECT OF PATIENTS
Individual level
INDICATOR 2: PATIENTS´ IDENTIFICATION AND SELECTION CRITERIA
Descriptive method: rules-based thresholds for certain parameters or pre-established decision criteria that describe a high-risk patient
INDICATOR 3. CASE SELECTION. PROGRAM SELECTION INCLUSION AND EXCLUSION CRITERIA
In Aragon, the Department of Health has launched the Complex Chronic Patient (CCP) Care Program, which includes patients following these inclusion criteria: Adjusted Morbidity Groups (GMA) ≥97%; Barthel index ≤60; ≥3 hospital admissions in last 12 months; and positive response to the first two questions of Barber´s questionnaire. For the implementation of the Chrodis ICMM, we are going to select those patients included in the CCP Program who also meet the following inclusion criteria: a) aged ≥65 years; b) ≥2 diagnoses of chronic diseases; c) ≥5 drugs dispensed. The patients may be included or excluded for the intervention according to GP´s clinical criteria up to a total of 200 patients.
INDICATOR 4. CASE EVALUATION: VARIABLES TAKEN INTO ACCOUNT TO ASSESS SPECIFIC PATIENT´S NEEDS
Diagnosis + severity + patient-level clinical requirements
INDICATOR 5: LEVEL/S USED TO IDENTIFY, AND SELECT PATIENTS.

	Case Identification of potential candidates	Case selection Inclusion into the program	Case evaluation Characterization and assessment of clinical requirements
Individual clinical assessment	Yes	Yes	Yes
Population risk stratification			

UCSC. Multimorbidity Care Model in elders with dementia and adults with intellectual disability

INDICATOR 1: EXISTENCE OF A FORMAL RISK STRATIFICATION APPROACH USED TO IDENTIFY AND SELECT OF PATIENTS
No formal risk stratification approach
INDICATOR 2: PATIENTS´ IDENTIFICATION AND SELECTION CRITERIA
Clinical criteria: Based on the clinician training, knowledge, instinct and experience.
INDICATOR 3. CASE SELECTION. PROGRAM SELECTION INCLUSION AND EXCLUSION CRITERIA
The present study will enrol individuals with dementia of probable Alzheimer's disease and adults with Down syndrome in a day hospital care. Diagnosis is based on clinical judgement. No specific exclusion criteria will be applied except for the unwillingness to participate.
INDICATOR 4. CASE EVALUATION: VARIABLES TAKEN INTO ACCOUNT TO ASSESS SPECIFIC PATIENT´S NEEDS
Diagnosis + severity + patient-level clinical requirements + specific characteristics (functional health status, pain, social/emotional support, activities of daily living, frailty, cognitive status and others)
INDICATOR 5: LEVEL/S USED TO IDENTIFY, AND SELECT PATIENTS.

	Case Identification of potential candidates	Case selection Inclusion into the program	Case evaluation Characterization and assessment of clinical requirements
Individual clinical assessment	Yes	Yes	Yes
Population risk stratification			

Kauno Klinicos

INDICATOR 1: EXISTENCE OF A FORMAL RISK STRATIFICATION APPROACH USED TO IDENTIFY AND SELECT OF PATIENTS
Both, individual and population level
INDICATOR 2: PATIENTS´ IDENTIFICATION AND SELECTION CRITERIA
Descriptive method: rules-based thresholds for certain parameters or pre-established decision criteria that describe a high-risk patient
INDICATOR 3. CASE SELECTION. PROGRAM SELECTION INCLUSION AND EXCLUSION CRITERIA
Patients with multimorbidity, who are on Kauno klinikos Family medicine clinic list and in one rural public -"Kaltinenai PHC centre" . The target population are patients with multimorbidity aged 40 and 75 years . Estimated number of patients is 200, patients' inclusion criteria: 2 and more chronic conditions at least from two following systems: I I11 ; I20 ; I25 ; I50 ; I48 II E11 III E06.3 ; E89 IV J44; J45 V M05; M15-M19; M80; M81; M54 VI G54; G55
INDICATOR 4. CASE EVALUATION: VARIABLES TAKEN INTO ACCOUNT TO ASSESS SPECIFIC PATIENT´S NEEDS
Diagnosis + severity + patient-level clinical requirements + specific characteristics (functional health status, pain, social/emotional support, activities of daily living, frailty, cognitive status and others)
INDICATOR 5: LEVEL/S USED TO IDENTIFY, AND SELECT PATIENTS.

	Case Identification of potential candidates	Case selection Inclusion into the program	Case evaluation Characterization and assessment of clinical requirements
Individual clinical assessment		Yes	Yes
Population risk stratification	Yes		

Model's information:

Item	Input
Name of the model	Patients with Multimorbidity
Acronym	MM
Description	Currently, MM use patients clinical data from administrative database to identify heavy users of multiple healthcare resources
Main technique	Threshold modelling - inclusion/exclusion criteria
Outcome type	No. events in time interval (Count)
Endpoint	Composite of state(s) and event(s)
Evaluation metric	Chi Square statistic
Evaluation metric value	The performance value
Description	Based on Age, gender, Dx (ACG), Rx, cost percentiles (age 40+)
Measured_risk	Utilisation of healthcare resources
Risk_time_frame	Prospective: one-year
Threshold	Risk score
Condition	At
Threshold value	0,5
Predictor category	Charlson Comorbidity Index
Data source	Outpatient data

VULSK. Family Medicine Center, Primary care

INDICATOR 1: EXISTENCE OF A FORMAL RISK STRATIFICATION APPROACH USED TO IDENTIFY AND SELECT OF PATIENTS
Both, individual and population level
INDICATOR 2: PATIENTS´ IDENTIFICATION AND SELECTION CRITERIA
VULSK uses both descriptive method and predictive tool to define the selection of patients
INDICATOR 3. CASE SELECTION. PROGRAM SELECTION INCLUSION AND EXCLUSION CRITERIA
Patients with multimorbidity, that are treated at Vilnius University Hospital Santaros Klinikos, Family Medicine Center and private family clinic "InMedica". The target population are heavy users of the healthcare resources between 40 and 75 years of age having more than one chronic condition. Estimated number of patients is 200, i.e. MM patients, selected from primary health care clinic aged: 40-75 years with 2 and more chronic conditions at least from two following systems: I I11 ; I20 ; I25 ; I50 ; I48 II E11 III E06.3 ; E89 IV J44; J45 V M05; M15-M19; M80; M81; M54 VI G54; G55
INDICATOR 4. CASE EVALUATION: VARIABLES TAKEN INTO ACCOUNT TO ASSESS SPECIFIC PATIENT´S NEEDS
Diagnosis + severity + patient-level clinical requirements + specific characteristics (functional health status, pain, social/emotional support, activities of daily living, frailty, cognitive status and others)
INDICATOR 5: LEVEL/S USED TO IDENTIFY, AND SELECT PATIENTS.

	Case Identification of potential candidates	Case selection Inclusion into the program	Case evaluation Characterization and assessment of clinical requirements
Individual clinical assessment		Yes	Yes
Population risk stratification	Yes		

Model's information:

Item	Input
Name of the model	Heavy users of healthcare
Acronym	HUH
Description	Currently, HUH use patients clinical data from administrative database to identify heavy users of healthcare resources.
Main technique	Threshold modelling - inclusion/exclusion criteria
Outcome type	No. events in time interval (Count)
Endpoint	Composite of state(s) and event(s)
Evaluation metric	Chi Square statistic
Evaluation metric value	The performance value
Description	Based on Age, sex, Dx (ACG), Rx, cost percentiles (age 40+)
Measured_risk	Unplanned (re)admission to hospital
Risk_time_frame	Prospective: one-year
Threshold	Risk score
Condition	At
Threshold value	0,5
Predictor category	Frailty
Data source	Outpatient data

3.3 Main findings

Risk stratification as a process to target, identify and select patients who are at risk of poorer health outcomes, and who are expected to benefit of their intervention. The five Pilots in WP 6 are using one. Two of them use and individual stratification approach whereas the other two use a population based stratification to identify and select candidate patients for their intervention. One of the does 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 is based on rules-based threshold and pre-established decision criteria that describe a high-risk patient. Precise inclusion criteria are used, including clinical diagnosis and parameters, functional status, health services utilization and/ social needs. The dimensions most commonly used are 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 use the described methods to identify, select and assess clinical requirements.

It is important to be clear about what it is wanted to predict and to ensure that risk prediction is embedded within a coherent strategy. Using Population Risk stratification can improve coverage and optimize the use of resources, targeting intervention to those that can benefit from them. Only two sites are using it. The ASSEHS Project´s Appraisal Standard and recommendations can be useful for sites that want to work further in the use population risk stratification to improve identification of patients and population groups. To implement a Risk stratification strategy, a high-quality operational plan establishing the agenda and the strategic goals and objectives for the years to come is needed. It requires a multidisciplinary team to manage the process and clinicians' commitment to implement it.

4. Implementation strategy

In JA CHRODIS PLUS, a common Implementation strategy has been developed for all the implementation pilot sites. It aims to serve as a guideline to facilitate the uptake in routine practice of good practices, policies and tools that will be implemented during the action. It includes a series of methods and techniques, concrete procedures and recommendations to enhance the adoption and sustainability of practices and the use of JA CHRODIS tools with demonstrated success.

The opinion and perspective of future users has been extensively collected and taken into consideration to ensure that the final strategy meets their particular needs, interests and expectations. This Implementation Strategy is the result of a productive collaborative work between KRONIKGUNE and JA CHRODIS PLUS coordinators, partners and dedicated experts.

A three-step implementation strategy has been defined to be followed by all implementation sites. It has been designed to be appropriate from the scientific point of view, applicable considering data availability and feasible according to project´s timeline and resources.

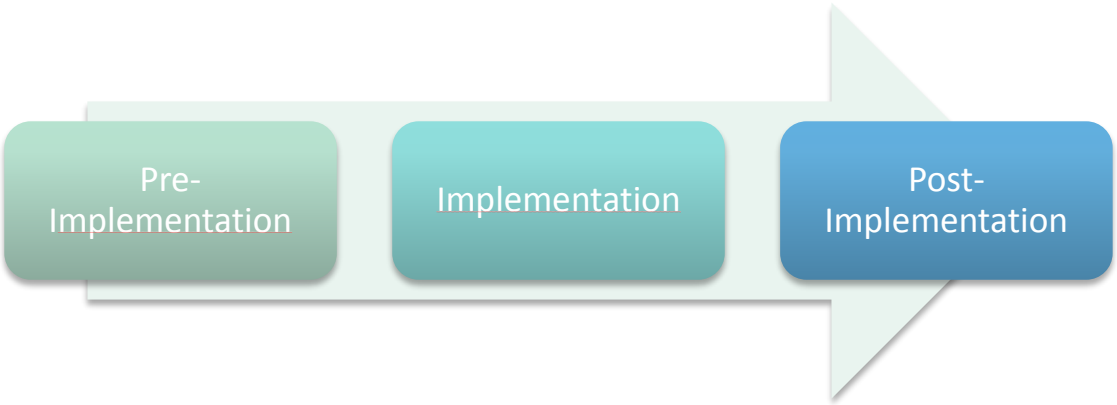


Figure 2: Implementation strategy phases

The implementation strategy is composed of two modules:

- Module I: including the guidelines to perform the Pre-Implementation phase
- Module II: including the guidelines to perform the Implementation phase and the Post-Implementation phase

This chapter presents the most relevant information of both Modules of the JA CHRODIS PLUS implementation strategy. Some of the items referencing to WP6 and the ICMM are adapted to the WP6 particularities in this chart.

More extended information of Module II, which includes including Implementation and Post-Implementation phases, will be presented in the D6.2 Pilot implementation and outcomes evaluation.

4.1 Local Implementation Working Group

The Local Implementation Working Group (LIWG) is the responsible to conduct the pilot implementation of the different practices in JA CHRODIS PLUS in the local health care, social, and legal context. It is integrated by Beneficiaries, Collaborative Partners and local stakeholders.

LIWG elaborate their specific organizational structures and processes of work and identify the appropriate local stakeholders to collaborate in their pilot implementations. Local stakeholders are individuals, institutions or organizations that are in any way interested by the activity, program, intervention or policy promoted. Although teams can vary in size and composition, each implementation site needs to include the appropriate persons in the group to ensure that all perspectives are covered.

Irrespective of the composition of the implementation group, the following functions and roles are preferably covered by the LIWG:

- 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 (can 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

According to the interest, influence and importance for success, the LIWG can consider different levels of involvement of the stakeholders:

- Full participation. The stakeholder is fully involved in the decision-making process.
- Consultation. The stakeholder is consulted during the decision-making process and its opinions are then discussed within the LIWG.
- Information. The stakeholder is fully informed on decisions and decision-making process.
- Passive. The stakeholder is briefly informed.

Organization of the LIWG meetings

All the LIWG members are invited to participate in all activities to ensure that a wide variety of opinions and interests are taken into consideration. The LIWG's Organizer is responsible for:

- Schedule, coordinate and run the meetings
- Identify and engage appropriate stakeholders
- Prepare the needed documentation
- Propose the agenda and oversee the minutes
- Produce the corresponding reports
- Share the results and report with the LIWG members
- Liaise with WP leaders
- Deliver the Pilot Action Plan

Preferably, meetings with the LIWG are in-person and each of them is expected to require between 2 to 3 hours. However, online meetings can be an option when face-to-face meetings are not possible.

Below the scheme to organize the working sessions:

The tasks to be covered in each meeting are detailed in Annex III.

4.2 Pre-Implementation phase

The objective of this phase is to identify, specify and analyse determinants that act as barriers and enablers that could influence implementation outcomes, and then to elaborate the Pilot Action Plans to be followed during the implementation and post-Implementation phases.

The Pre-Implementation phase consists of the following steps:

1. Definition of the scope of the intervention and selection of topics to implement
2. Situation analysis using the Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis
3. Elaboration of the Pilot Action Plans

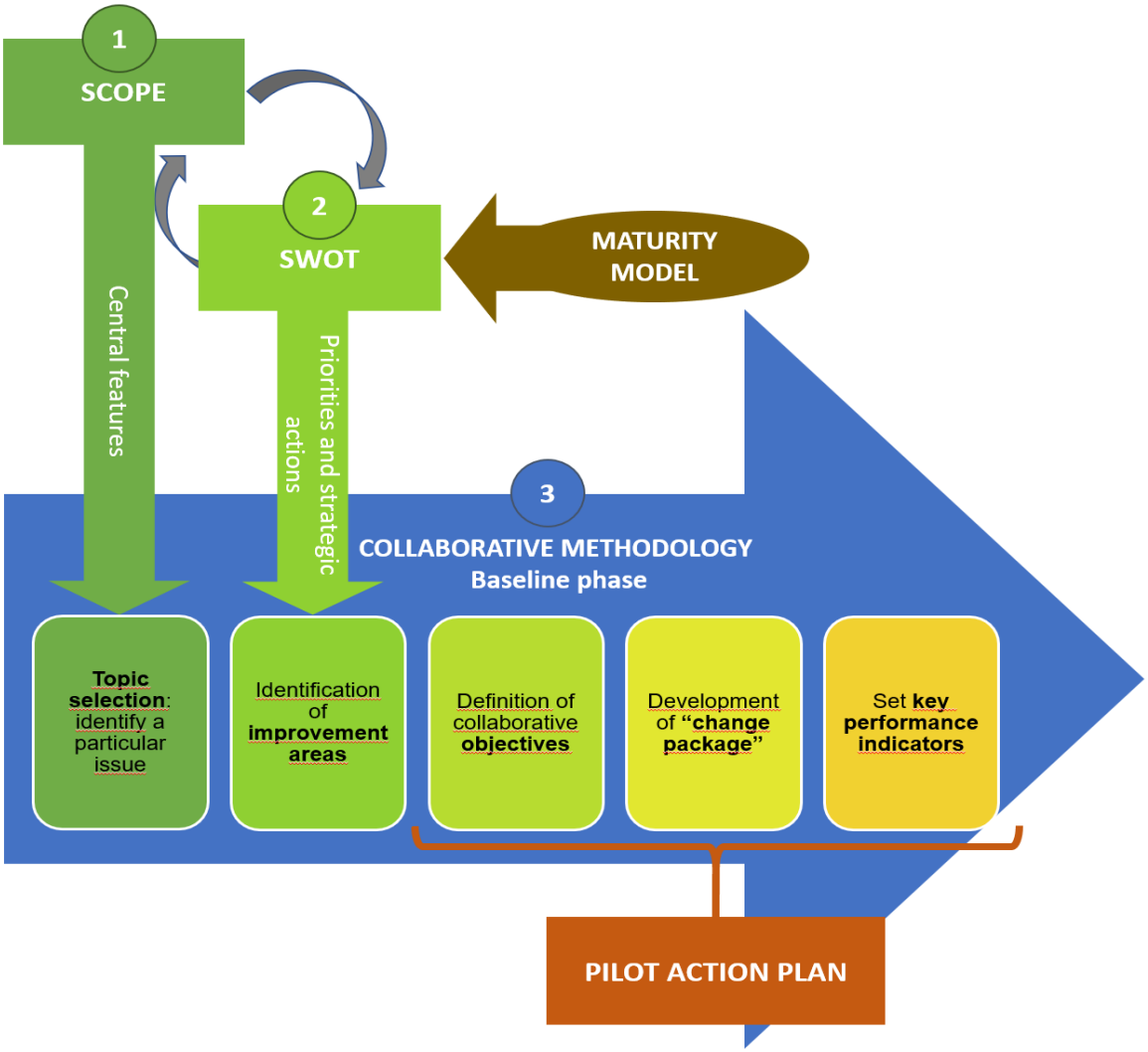


Figure 3: Pre-implementation strategy phase's scheme

4.2.1. Scope of the intervention

The objective of this step is to select the specific features or elements of the intervention that will be implemented by the LIWG according to local needs, interests and capabilities. In the case of WP6, the components of the ICMM will be also selected.

The scope of an intervention means the extent of the area or subject matter that practices deal with, the range of operation. Given the specifics of JA CHRODIS PLUS, scope selection means defining that will be implemented by each LIWG. It depends on local needs, expectations, strategic objectives and real possibilities. In consequence, the criteria for scope definition vary from site to site.

Following the collaborative methodology approach, structured group discussion, the LIWG reflects on the intervention elements that can be integrated in their context.

The definition of the scope follows the steps below:

1. Identify and describe the problem/challenge.
2. Describe the general purpose of the intervention.
3. Describe the target population.
4. Analyse the ICMM's components and identify the central features that are essential to achieve the desired results. Central features of ICMM are described in the JA CHRODIS results.
5. Selection of the components of the ICMM that will be implemented.

The template to be used for scope definition by LIWG is included in Annex IV.

4.2.2. Situation analysis - Strengths, Weaknesses, Opportunities, Threats (SWOT)[21]

The objective of this step is to identify organization's strengths and weaknesses, as well as broader opportunities and threats to develop a fuller awareness of the situation and to help with both strategic planning and decision making.

Implementing a new intervention requires taking into account the current situation or system context. It is necessary to identify the environmental factors influencing and understand how they can affect the implementation of an intervention. It is not only necessary for the system where the implementation takes place but also for future adopters who might need to know the characteristics of the original system.

SWOT analysis is an analytical method which is used to identify and categorize significant internal (Strengths and Weaknesses) and external (Opportunities and Threats) factors faced either in a particular area, such as an organization, or a territory, such as a region, nation, or city. This analysis helps an organization to determine how to allocate the resources to accomplish its goals[22,23].

[21] Mirca Barbolini, as Public Health and EU Commission Senior Expert, has significantly contributed to the SWOT approach
[22] FOR-LEARN- JRC EUROPEAN COMISION- SWOT (Strengths Weaknesses Opportunities and Threats) Analysis [Internet]; Available at:http://forlearn.jrc.ec.europa.eu/guide/4_methodology/meth_swot-analysis.htm
[23] Chapter 3. Assessing Community Needs and Resources | Section 14. SWOT Analysis: Strengths, Weaknesses, Opportunities, and Threats | Main Section | Community Tool Box [Internet]. [cited 2017 Nov 30]. Available from: http://ctb.ku.edu/en/table-of-contents/assessment/assessing-community-needs-and-resources/swot-analysis/main

The SWOT analysis is particularly suited to the objectives of JA CHRODIS PLUS due to its features:

- Flexible: it can be applied to any context, program, and stage of implementation;
- Simple: the methodology is easy-to-use and accessible by non-technical stakeholders;
- Structured: the frame is well structured, making it easy to explore the different areas of analysis (S, W, O, T), to identify internal categories and to verify internal coherence;
- Comparable: being a structured method, it is possible to generate a meta-SWOT, comparing different analysis from different contexts;
- Participatory; the analysis can be performed by involving different stakeholders. This is valuable to develop the sense of ownership of the intervention or practice that is being implemented.

The purpose of performing a SWOT is to reveal positive forces that work together, and potential problems that need to be recognized and possibly addressed. It also enables participants to make a judgment and share their vision in a structured way, in order to enrich the common perception.

The SWOT analysis also offers a simple way of communicating in a glance about a project, intervention, program or policy, describing both internal attributes and external conditions:

- Strengths are positive internal attributes that are controlled by a country, region or a local organisation, and which provide foundations for the future (examples: integration between primary care and hospital services at regional level).
- Weaknesses are negative internal attributes, which are controlled by a country, region or a local organisation, that need to be addressed (examples: lack of an integrated health information system through levels of care).
- Opportunities are external positive conditions that may facilitate the implementation. They are often beyond the influence of a region or a local organisation or are at the margins (for example: existence of a national policy on health information systems).
- Threats are external conditions that may stand in the way of the implementation (for example: limited allocation of resources to the local level).

In the frame of JA CHRODIS PLUS, the SWOT analysis is used ex-ante, for situation analysis, preceding the implementation.

General dimensions that can be considered for the SWOT analysis are:

- Sustainability
- Organization
- Empowerment
- Communication
- Monitoring and evaluation

Questions that can help guiding the SWOT:

STRENTGHS	WEAKNESSES
What are your advantages? What do you do well? What relevant resources do you have access to? What do other people see as your strengths?	What could you improve? What do you do badly? What should you avoid?
OPPORTUNITIES	THREATS
Where are the good opportunities in front of you? What are the interesting trends you are aware of?	What obstacles do you face? What is your competition doing? Are the specifications for your services changing?

Proposed steps and the template to conduct the SWOT analysis are included in the ANNEX V.

The main output of the Situation analysis is a matrix presenting the most important strengths, weaknesses, opportunities and threats for the organization examined and (i) aiming at giving a reasonable overview of major issues and (ii) setting priorities and strategic actions that have to be considered when planning the implementation of the intervention.

The process of defining the scope and analysing the situation can be iterative, meaning that findings arisen in a given step can feed the previous one and result in modifications with the aim of approaching the most appropriate decision.

As an ancillary technique, the Scirocco Maturity Model, developed in the SCIROCCO project[24], which helps recognizing the maturity requirements of healthcare systems to deliver integrated care can facilitate or guide the situational analysis. In the Maturity Model, the many activities that need to be managed in order to provide integrated care have been grouped into 12 dimensions: breadth of ambition, capacity building, citizen empowerment, evaluation methods, finance and funding, information and eHealth services, innovation management, population approach, readiness to change, removal of inhibitors, standardization and simplification, and structure and governance.

In JA CHRODIS PLUS, The Maturity Model might be useful especially for those groups aiming at implementing interventions related to integrated care, mHealth solutions and ICMM components.

More information of the Maturity Model dimensions and scales and template for the final diagram are included in the Annex VI.

[24] https://www.scirocco-project.eu/

4.2.3. Action Plan

The objective of this step is to define the local Pilot Action Plan that will guide the implementation of the intervention.

The Action Plan is the way the LIWG's vision is made concrete. It describes a sequence of steps that need to be taken, or activities that need to be carried out. In JA CHRODIS PLUS, the action plan outlines the concrete activities that will support LIWG to implement changes and meet its objectives in their site.

In JA CHRODIS PLUS, an adapted version of the iterative cyclic nature of the Collaborative Methodology[25] is used for drafting the local Action Plans. Collaborative methodologies based on Plan-Do-Study-Act (PDSA) cycles are effective for multidisciplinary teams and help implementing changes.

The collaborative approach, and consequently the adapted version that will be used in JA CHRODIS PLUS, is a simple, yet powerful tool for implementing changes. This methodology requires multidisciplinary teams, as the LIWGs, to come together periodically to learn change ideas and quality methods, and to exchange experiences with making changes. Collaborative learning methods can stimulate implementation of changes, promote learning skills among participants and fasten the dissemination of good ideas.

During this step the LIWG will answer three questions:

- What are we trying to accomplish?
- What changes can make that will result in improvement?
- How will we know that a change in an improvement?

In order to provide an answer to the questions above, LIWGs will identify improvement areas, define objectives, develop the “Change Package” and set key indicators, through the following steps:

1. Identify the specific issues to work on
   The central features or elements of the intervention to work on have been already selected during the definition of the scope.
   In the case of WP6, components of the Integrated Care Model for Multimorbidity (ICMM) are chosen.
2. Detect improvement areas
   Based on the situational analysis, LIWG will identify concrete improvement areas. The priorities and strategic actions defined in the SWOT analysis help defining precise and specific improvement areas to work on.
3. Define specific objectives
   According to the improvement areas detected, the LIWG will specify achievable and realistic objectives.
4. Develop the Change Package
   Based on the improvement areas and the associated objectives, concrete activities will be described and documented in the Change Package. The Change Package is the set of changes that

[25] Institute for Healthcare Improvement: The Breakthrough Series: IHI’s Collaborative Model for Achieving Breakthrough Improvement [Internet]; Available at: http://www.ihi.org:80/resources/Pages/IHIWhitePapers/TheBreakthroughSeriesIHIsCollaborativeModelforAchievingBreakthroughImprovement.aspx

lead to improvement and successful implementation of the practice or JA CHRODIS tool during the Implementation Phase. Each objective defined in the previous step will require at least one activity.

5. Set key performance indicators
   Key performance indicators will be defined by the LIWG ensuring that the expected impact of the interventions can be measured. The LIWG needs a defined challenging, achievable and measurable target which encourages and motivates team members to work on the implementation goal. It is important to use existing data to measure the progress towards the target. Evaluation and measurement skills (data collection and analysis) needs be in place and the results need to be provided to the LIWG to ensure good quality of the work and keep teams focused. The Change Package will include for each objective at least one key performance indicator.

The indicators can be of two types depending on the implementation site´s preferences: health-related outcomes and/or process indicators.

Pilot Action Plans result from the steps described above (objectives, activities, and indicators), which, in turn, are directly linked to scope definition/topic identification and situation analysis.

4.3 Implementation phase

The objective of this phase is to specify and describe the steps in the process of transferring practices and tools into real practice. Pilot Action Plans elaborated during the pre-implementation phase are the basis to be followed during this phase. The implementation phase runs between months 14 and 29 of the project, from November 2018 to January 2020.

This phase consists of the following actions:

1. Carry out the implementation
2. Data collection
3. Monitoring of the implementation

In comparison to more traditional healthcare research, the Plan-Do-Study-Act (PDSA) cycle presents a pragmatic scientific method for testing changes in complex systems. The four stages mirror the scientific experimental method of formulating a hypothesis, collecting data to test this hypothesis, analysing and interpreting the results and making inferences to iterate the hypothesis[26,27,28].

The pragmatic principles of PDSA cycles promote the use of an iterative approach to test interventions. This enables rapid assessment and provides flexibility to adapt the intervention according to feedback to ensure fit-for-purpose solutions are developed. It also promotes prediction of the outcome of a test and subsequent measurement over time (quantitative or/and qualitative) to assess the impact of an intervention on the process or outcomes of interest. In recognition of working in complex settings with inherent variability, measurement of data over time helps understand natural variation in a system, increase awareness of other factors influencing processes or outcomes, and understand the impact of an intervention [22, 23, 24].

The steps of the PDSA approach are:

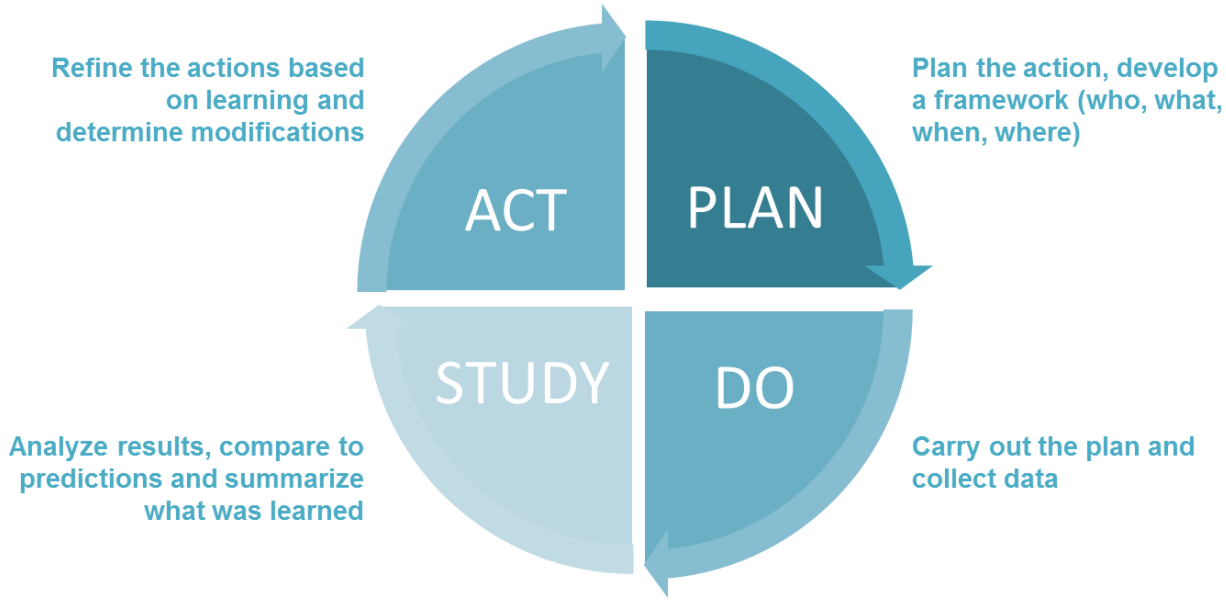
- PLAN: Plan the actions defined in the Pilot Action Plan to test the changes. Detail actors (who), functions and roles (what), timeframe (when) and setting (where).
- DO: Test the action and once is finished, data are collected and any problem or unexpected observation is documented.
- STUDY: The data obtained during the testing step are analysed. The obtained results are compared to the predictions. Learning is summarized.
- ACT: Based on the lessons learned changes are refined. Modifications are determined. This improved change is then re-implemented in a new PDSA cycle.

In JA CHRODIS PLUS implementation sites will perform at least one PDSA cycle during the implementation phase. LIWGs will go through the four steps as described below.

[26] Taylor MJ, McNicholas C, Nicolay C, Darzi A, Bell D, Reed JE. Systematic review of the application of the plan–do–study–act method to improve quality in healthcare. BMJ Qual Saf. 2014 Apr 1;23(4):290–8

[27] Reed JE and Card AJ.The problem with Plan-Do-Study-Act cycles. BMJ Qual Saf 2016;25:147–152.

[28] Coury J et al. Applying the Plan-Do-Study-Act (PDSA) approach to a large pragmatic study involving safety net clinics. BMC Health Services Research (2017) 17:411



PLAN

PLAN step operationalizes the activities defined in the Change Package of the Pilot Action Plan. It consists of a face-to-face session in which the LIWG members reflect on, discuss, agree and plan in detail how to carry them out. These activities will be implemented locally in the DO step. It is important to note that the procedure to collect the Key Performance Indicators (KPIs) specified in the Action Plan needs to be carefully planned: what type of data is needed, who is the responsible for gathering information, when the data will be collected and which data sources and methods (quantitative and/or qualitative) will be used. The analysis and interpretation of the data will be performed during the STUDY step.

DO

The DO step, which is framed within the action period, implements and tests the activities. Data (KPIs) will be collected and registered to measure the impact during the STUDY step (KPIs). They are mainly process indicators but health related outcomes might be expected as well.

STUDY

The STUDY step analyses and interprets the results. It consists of at least one face-to-face session of the LIWG. Key Performance Indicators defined in the Action Plan will be assessed. The collection of quantitative data will depend on local needs and possibilities (data registries and sources, data exploitation resources). Qualitative analysis based on focus groups or semi-structured interviews can be done as well. The discussion of the results can also involve local and national institutions, not only to have a clearer understanding but to support sustainability too.

The assessment of the results will be done at mid-term and at the end of the implementation phase. If sites only perform one PDSA cycle, the STUDY step will be merged with the impact assessment previously described. If sites carry out more than one PDSA cycle, only the STUDY step of the last cycle will be merged with the final impact assessment (see figure below). Yet meetings in a three-month basis are recommended.

ACT

In the ACT step the activities implemented are adjusted or even reformulated based on the findings of the STUDY step. The LIWG is responsible for discussing and agreeing the next steps. The decisions made during this phase are the starting point of the next PDSA cycle. If implementation sites perform only one PDSA cycle, ACT step will define actions that go beyond the timeframe of the JA CHRODIS PLUS.

In Annex II, templates to report each phase of the PDSA cycle are included to ensure systematic and rigorous reporting of the process. These templates aim to be operational tools to gather in a structured manner the work done during the different steps of the PDSA cycles.

4.4 Post-implementation phase

During this phase LIWGs will analyse, interpret and discuss the results. The Post-implementation phase runs between months 27 and 30 of the project, from November 2019 to February 2020.

4.4.1. Impact assessment

The impact assessment evaluates the intervention/tool results in real settings[29]. It will analyse both health-related outcomes on the target population and process measures. This is done with the Key Performance Indicators selected in the Pilot Action Plan. The selection of the analysis depends on the intervention implemented and data availability.

The impact assessment will include the key findings, including relevance to the rationale and specific aims of the intervention. It will analyse the association between the intervention(s) and the outcomes and compare the results with findings from other experiences. It will try to ascertain the impact of the project on people and systems and reasons for any differences between observed and anticipated outcomes. It will describe the limitations of the project and propose recommendations for future actions.

The STUDY and ACT steps of the last (or only) PDSA cycle merge with the impact assessment.

4.4.2. Implementation process assessment

The Consolidated Framework for Implementation Research (CFIR) will be used to analyse the factors related to distinct levels of care provision (patient, care provision groups, health organization or policy) that might have hindered or facilitated the implementation process. Using CFIR will allow LIWGs not only to learn a specific methodology that helps identifying relevant factors affecting the implementation but also to increase success rate in future implementation experiences. The results of this analysis will be included in a specific item within the SQUIRE 2.0.

The CFIR provides a menu of constructs that have been associated with effective implementation. The CFIR is easily customized to diverse settings and scenarios. It comprises five major domains (the intervention, inner and outer setting, the individuals involved, and the process by which implementation is accomplished) and each of them includes several constructs. These domains interact in rich and complex ways to influence implementation effectiveness[30,31,32,33,34].

[29] Glasgow RE, Brownson RC, Kessler RS. Thinking about Health-Related Outcomes: What Do We Need Evidence about? Clin Transl Sci. 2013 Aug;6(4):286–91.
[30] Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci IS. 2009 Aug 7;4:50.
[31] Consolidated Framework for Implementation Research (CFIR) webpage [Internet]; Available at: http://www.cfirguide.org/
[32] Keith RE, Crosson JC, O'Malley AS, Cromp D, Taylor EF. Using the Consolidated Framework for Implementation Research (CFIR) to produce actionable findings: a rapid-cycle evaluation approach to improving implementation. Implement Sci. 2017 Feb 10;12:15.
[33] Breimaier HE, Heckemann B, Halfens RJG, Lohrmann C. The Consolidated Framework for Implementation Research (CFIR): a useful theoretical framework for guiding and evaluating a guideline implementation process in a hospital-based nursing practice. BMC Nurs [Internet]. 12 de agosto de 2015; Available at:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4533946/
[34] Birken SA, Powell BJ, Presseau J, Kirk MA, Lorencatto F, Gould NJ, et al. Combined use of the Consolidated Framework for Implementation Research (CFIR) and the Theoretical Domains Framework (TDF): a systematic review. Implement Sci IS [Internet]. 5 de enero de 2017; Available at:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5217749/

The CFIR constructs by domain are:

Characteristics of the intervention

- Intervention Source
- Evidence Strength & quality
- Relative Advantage
- Adaptability
- Trial ability
- Complexity
- Design Quality & Packaging
- Cost

Outer Setting

- Patient Needs & Resources
- Cosmopolitanism
- Peer Pressure
- External Policy & Incentives

Inner Setting

- Structural Characteristics
- Networks & Communications
- Culture
- Implementation Climate
- Tension for Change
- Compatibility
- Relative Priority
- Organisational Incentives & Rewards
- Goals and Feedback
- Learning Climate
- Readiness for implementation
- Leadership Engagement
- Available Resources
- Access to Knowledge & Information

Characteristics of Individuals

- Knowledge & Beliefs about the Intervention
- Self-efficacy
- Individual Stage of Change
- Individual Identification with Organisation
- Other Personal Attributes

Process

- Planning
- Engaging
- Opinion leaders
- Formally Appointed internal implementation Leaders
- Champions
- External Change Agents
- Executing
- Reflecting & Evaluating

The CFIR provides researchers with a framework in which they can select the most relevant constructs in the particular field of their study and use them to analyse and better understand the implementation process and improve further deployment of the practices and tools.

The description of the CFIR constructs by domain is included in Annex III.

In JA CHRODIS PLUS LIWGs will meet to review and reflect on the potential variables that, in their opinion, could have had impact on the implementation process. Group members will not only highlight and analyse the factors (constructs) that have acted as barriers or facilitators during the whole process but also define a battery of recommendations based on learning for future deployment of practices and tools.

The analysis and the recommendations for future implementation of practices and tools will be reported in the adapted SQUIRE 2.0.

4.5 Reporting

An adapted version of the Standards for QUality Improvement Reporting Excellence (SQUIRE 2.0) guidelines will be used to report the whole implementation study in each region from both implementation process and intervention effectiveness perspectives to enhance the evidence base and transferability potential (see ANNEX VII). The adaptation has been made based on other published protocols[35,36,37,38,39].

Pilot Action Plans will follow the structure of the adapted SQUIRE 2.0. Specifically, Pilot Action Plans will partially feed the adapted SQUIRE template (9 first items) which is the tool to report the whole implementation process.

The information obtained during the implementation and post-implementation phases will complete the analysis, results, implementation process, summary, interpretation and limitations' sections. Based on the impact assessment and the CFIR, the local LIWG and the facilitator will draw the main conclusions of the intervention including: the usefulness of the work, the sustainability, potential for spread to other contexts, implications for practice and for further study in the field and suggested next steps.

This information, together with the sections completed in the pre-implementation phase and the ethical and funding considerations, will build the final SQUIRE 2.0 report.

[35] SPIRIT checklist. Standard Protocol Items: Recommendations for Interventional Trials. Available at URL: http://www.spirit-statement.org/

[36] Patient-Centred Outcomes Research Institute (PCORI). Methodology Standards Checklist. Available at URL: https://www.pcori.org/

[37] ENCePP Checklist for Study Protocols. Available at URL: www.encepp.eu

[38] Research Protocol by the World Health Organization

[39] Pinnock H et al. Standards for Reporting Implementation Studies (StaRI) Statement. BMJ 2017; 356 doi: https://doi.org/10.1136/bmj.i6795

5. Pilot action plans

This chart presents the Pilot Action Plans of the five programmes that participate in WP6 of JA CHRODIS PLUS.

All the implementers have followed the proposed implementation strategy during the preparatory phase. LIWGs were created in the first months of the project. Once the scope and made the situation analyses, the LIGWs selected the improvement areas and defined change packages of their interventions. Finally the Pilot Action Plan[40] was developed in each site. As stated before, it follows the structure of the first 9 items of the adapted SQUIRE 2.0 guidelines.

The LIWGs, the Scope and SWOT steps and the Improvement areas and change package developed in each of the programmes are presented in Annex VIII.

5.1. CSJA. Implementation of a 'Personalized Action Plan' within the Strategy and the Comprehensive Plan for complex chronic patient

1. Problem Description

Providing personalized care as cornerstone of those actions intended to complex chronic patients (patients with chronic severe health problems, multimorbidity and polypharmacy).

European countries face a rapid increase in their population living with chronic conditions, which puts a high pressure on their health systems. In addition, chronic non-communicable health diseases have replaced communicable (or infectious) diseases as the dominant health care burden, as they are now the main causes of morbidity and mortality in many developed countries. Moreover, not only do data show that an increasing proportion of the chronically ill is multimorbid, but also caring for people with multimorbidity also seems to be more complicated. Nevertheless, day a day, people with multimorbidity need specialized care, including inter-sectoral coordination as well as collaboration between primary care and specialized care, so many obstacles must be overcome. Thus, multimorbidity has become in one of the most important challenge for healthcare system that must be tackled with a long term view.

The region of Andalusia, which covers an area of 87.5 km^2 in the south of Spain, has a population of 8.4 million (18% of the total population of the country) and one of the highest life expectancy rates in the world, reaching on average 81.9 years (79.2 for males and 84.6 for females). In addition, population aged 65 and over registered in Andalusia represents 16.32% (1 369 259 inhabitants in 2016) of the Andalusian population (in 2014 represented 15,91%). It is expected that this percentage will rise even more in coming years. Thus it is estimated that over 2 164 393 citizens aged 65 and over by 2035.

Multimorbid patients are responsible for most avoidable hospital admissions in the region and four percent of the Andalusian population with multimorbid diagnostic codes consume up to 30% of primary care and hospitals resources. Based on corporate information systems, nearly 245 412 complex chronic patients (patients with chronic severe health problems, multimorbidity and polypharmacy) were identified in early 2018.

[40] Pilot Action Plans were agreed with WP6 leaders and the process was supported by the EU Commission expert Mirca Barbolini.

Spain has a decentralised health system[41] where health competences are devolved to the regional level, resulting in 17 regional health ministries with autonomy for health policy and health services delivery within their territory. Andalusia has full autonomy for health policy (since 1984).

The Andalusian Regional Ministry of Health is responsible for public health, health policy, planning and regulation, and the provision and management of health care in the region. It also provides leadership of the Andalusian Public Health System (APHS). As stated in the Andalusian Health Act (1998) and the Andalusian Public Health Act (2011), APHS's driving principles are based on equity, guaranteed rights related to health care, territorial homogeneity, accessibility, transparency and participation.

APHS is responsible for the provision of universal health care in the region, also to undocumented migrants. It comprises a wide network based on accessible, high-quality, patient-centred care. There are two levels of care: (i) primary health care, which forms the backbone of the system and is provided in 1500 centres grouped in health districts (the managerial unit for this level of care) throughout the region; and (ii) specialized care of varying complexity, which is available in 49 public hospitals. There are other dependent entities that foster research and innovation in the field of public health and health care in the region, such as the Biobank Network, a specific public enterprise for emergency care, the Andalusian School of Public Health, and the Progress and Health Foundation.

As part of the Spanish Health System, APHS is funded by taxes and operates predominantly in the public sector. Health care is provided free of charge at the point of care; medication is covered in part. There are 96 500 health-care professionals working in the public health-care system in the region.

The overarching goals of the region's health policy are stated in the Andalusian Health Plan, which is passed by the Regional Government. It defines the action to be taken by the different departments, using the Health-in-All Policies (HiAP) as backbone approach, as well as the funding each department shall allocate to this end. It specifies objectives for each of the eight provinces in connection with which local health-related action plans are drawn up in each municipality. Health impact assessment (HIA) is compulsory for all sectoral plans and programmes passed by the Regional Government that could have an impact on health, general urban planning, and activities related to environmental control.

To further develop the action lines included in the Andalusia Health Plan, several transversal plans have been designed to tackle the most relevant health-related issues. Examples of these are the Plan on Comprehensive Health Care for Patients with Chronic Diseases and the Andalusian Comprehensive Care Strategy.

2. Available knowledge

Multimorbid patients usually have complex health needs. However, there is still a focus on traditional disease-oriented approaches, so they often receive a fragmented form of care, leading to inefficient and even potentially harmful clinical interventions. They are often exposed to complex drug regimens, which increase the risk drug–drug interactions, adverse drug reactions and, therefore, poor treatment adherence.

Compared to patients with single chronic disease, multimorbid patients more often have problems related to pain and cognitive problems, self-care, and quality of life. Even more, multimorbidity is more prevalent among socially disadvantaged population groups, so a system failure providing appropriate care has a deep

[41] The Spanish Ministry of Health, Consumer and Welfare is still responsible for the national coordination, certain strategic areas and the national monitoring of health system performance.

impact on citizens' equity. Therefore, multimorbid patients need specialized care, inter-sectoral coordination as well as collaboration between primary care and specialized care which leads to a challenging care and treatment.

However, second level care and hospital care in European countries are almost entirely organized around medical specialties focusing on specific organ systems, which carry with it the risk of losing sight of a patient's integral health condition. These are one of the most important reasons why care for people with multimorbidity is suboptimal in many countries.

Therefore, integrated care programs are needed for people with multimorbidity. This kind of programs support patient involvement in thanks to the development of individual care plans, tailored to the patient needs, explicitly involving informal carers and establishing multidisciplinary and cross-sectoral synergies.

Nevertheless, although some integrated care programs for multimorbidity are currently being implemented, only few are documented in the literature, being most of them tested in small populations. Consequently, there is limited evidence on their real outcomes. For example, some results suggested that comprehensive care for multimorbidity might increase patient satisfaction, health-related quality of life, and functioning. However, the efficacy of these care programs is insufficient, and in-deep assessment in real population is needed to reach conclusions.

Moreover, some in deep surveys were made at regional level. The main one is the situation analysis performed for the development of the Andalusian Comprehensive Healthcare Plan for Patients with Chronic Diseases. This situation analysis included a demographic, epidemiological and resource analysis of the region, as well as an expectations assessment of the patients, caregivers and professionals. Besides, a systematic review was carried out with the aim of identifying interventions that had shown to improve multimorbid patients' health outcomes (2014-2016). Thus, taken into account the literature review as well as the local situation, the new edition of the Andalusian Integrated Care Process 'Healthcare for Multimorbidity Patients' was published in 2018.

3. Rationale

Multimorbidity patients may attain greater value to functional outcomes and wellbeing that clinical outcomes. Thus, when healthcare systems turn from a 'disease orientated' to a 'person-centered' care approach, a paradigm shift is made.

Patient-centered approach encompasses refers to care that is respectful of and responsive to individual patients' preferences, needs, and values, and ensures that patient values guide all clinical decisions. For people with multimorbidity, the main aspects of patient-centered care are:

- Taking their individual needs, preferences and own resources as a starting point for their evaluation and the development of an individual care plan.
- Involving of their informal caregivers in the care process;
- Involving all relevant care levels and health disciplines in the care process
- Ensuring the coordination of the multidisciplinary care and care levels.

Individual care plans are intended to provide a holistic care that is tailored to the needs, preferences and resources of patients. Therefore, they need to include health goals that are considered relevant by patients, goals that must guide the shared process of decision-making. Thus, patients need to be well-informed about the care and treatment options they have to follow to meet the agreed goals.

Besides, multidisciplinary collaboration and coordination is of great importance for the care process of people with multimorbidity, not only at the beginning of the process but also for the continuity of care over time. Therefore, 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.

Although, there isn't enough evidence on this matter because only few scientific studies have been conducted in this area, it is expected that individual care plans increases multimorbid patient's satisfaction as well as related health outcomes.

4. Specific aims

The general purpose of the intervention in the pilot in Andalusia is the assessment of the application of individualized care plans to multimorbid patients, within the framework of the Andalusian Public Health System strategies and plans that apply.

The pilot will be implemented in Primary Healthcare Centres of the Andalusian Health Service (SAS). Primary Healthcare is the first level access of citizens to and the backbone of the Andalusian Public Health System. It is characterized by providing a patient-centered comprehensive healthcare including preventive, treatment and rehabilitation services as well as health promotion, health education and epidemiologic surveillance.

Complex chronic patients (patients with chronic severe health problems, multimorbidity and polypharmacy) have been selected as target population of the intervention.

Inclusion criteria that will be used are those set in:

- The Comprehensive Healthcare Plan for Patients with Chronic Diseases.
- The Integrated Care Process 'Healthcare for Multimorbidity Patients'.
- The Andalusian Comprehensive Care Strategy.

5. Context

The non-communicable diseases approach is tackled in a comprehensive way across Andalusian regulation, strategies and plans.

Andalusian Public Health System's driving principles are collected in the Andalusian Health Act (1998) and the Andalusian Public Health Act (2011). These principles include equity, guaranteed rights related to health care, territorial homogeneity, accessibility, transparency and participation.

The overarching goals of the region's health policy are stated in the Andalusian Health Plan, which is passed by the Regional Government, using the Health-in-All Policies approach as backbone. The 'IV Andalusian Health Plan' was launched in 2013. It aims to protect and improve the health status of the Andalusian population by addressing the determinants and living conditions that affect them. Its guiding principles are to promote people's health, to increase citizens' life expectancy, to boost citizen participation, to include health in all policies, and to reduce social inequalities in health. Furthermore, the 'Andalusian Plan for Primary Healthcare Renewal', launched on June 2016, is mainly defined by the following principles:

- Focusing on the individual, as a whole, beyond organs or system-specific illnesses.

- Bearing in mind that every person lives within a family, community and social context, which will to a large extent determine people's health.
- Go beyond its role as entry point to assume the role of health agent, and become organisers of the care received in a whole health, social and community system.

Citizens are the center of the APHS. In this context, among the most remarkable Andalusian health policy goals are:

- The universal access, access to good quality care, equity and solidarity as driving force to improve the APHS.
- Modernize health organizations, making them more flexible and citizen-centred, ensuring clinical governance and transparency.
- Increase the value of the Public Service System.

Additionally, in the framework of Andalusian health policy competences, 'Comprehensive Health Plans' compile adopted measures in response to major health problems. Thus, the 'Comprehensive Healthcare Plan for Patients with Chronic Diseases' (published in 2012) was developed with the aim of ensuring the comprehensive care with a multidisciplinary response to multimorbid patient needs in relation to the health promotion, disease prevention and treatment, taken into account their functional rehabilitation, and contributing to their health recovery. In this sense, it also establishes a strategic alliance and an effective coordination with all those strategies, plans and actions of the Andalusia Public Health System that will contribute to preventing and addressing chronic disease. This plan is complemented with the Andalusian 'Comprehensive Care Strategy' and the 'Andalusian Plan for Primary Healthcare Renewal'.

Linked to 'Comprehensive Health Plans', 'Integrated care Processes' aim decreasing clinical variability, and improving quality of care received by patients. In this respect, another aspect to be highlighted is that the 3^{ed} edition of the Integrated Care Process 'Healthcare for Multimorbidity Patients' has just been published in early 2018. This reference document includes all processes and activities aimed at ensuring the comprehensive care of multimorbid adult patients through the coordination of professional services and/or centers over time.

As a result of the APHS experience thorough the years, It could be said that the sum of 'Comprehensive Health Plans' and 'Integrated Care Processes' is a useful tool for the coordination among population health needs, policies, health care levels as well as resource availability. In fact, several improvement areas were identified during the definition of the 'Andalusian Plan for Primary Healthcare Renewal'. These improvement areas were also recognised by the LIWG during the SWOT analysis (particularly the weaknesses).

The pilot will be implemented in Primary Healthcare Centres of the Andalusian Health Service (SAS). Primary care is the first level access of citizens to and the backbone of the Andalusian Public Health System. There are 1 500 centres grouped in health districts (the managerial unit for this level of care) throughout the region, ensuring territorial homogeneity and universal access. Primary care is characterized by providing a patient-centered comprehensive healthcare including preventive, treatment and rehabilitation services as well as health promotion, health education and epidemiologic surveillance. Primary Healthcare Centres staff include family physicians, primary care nurses, pediatritians case manager nurses and social workers, physiotherapists, odontologists, midwifes, among others.

Nonetheless, mainly due to resources constrains (e.g. lack of time, human resources) there are some challenges/problems that should be addressed, such as the improvement of the continuity of care between care levels, the coordination between healthcare and social services, as well as a deeper involvement of patients (and their caregivers) in their disease self-management.

The selected improvement area by the LIWG has been "lack of data on the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients in their general health status".

The availability of a single shared electronic health record (eHR) in the Andalusian healthcare system together with the alignement of the pilot action plan with several policies and strategies (mainly the 'Comprehensive Healthcare Plan for Patients with Chronic Diseases', the Integrated Care Process 'Healthcare for Multimorbidity Patients', the Andalusian 'Comprehensive Care Strategy' and the 'Andalusian Plan for Primary Healthcare Renewal'), facilitates the sustainability of the measures described in the action plan.

6. Intervention

The Andalusian LIWG is composed by a multidisciplinary team that covers all needed roles and functions for the intervention design and its afterward implementation. Thus, specifics of the team involved in the work are showed below:

- Qualification in the field of health sciences.
- Experience in primary and/or secondary healthcare levels.
- Knowledge in public health.
- Knowledge in statistics.
- Experience advisoring decision makers and/or politicians.
- Experience in international healthcare forums.
- Experience in international R&D projects.
- Experience in international project management.

Taken into account the Andalusian local context, the overall goal of the intervention is the multimorbid patient empowerment, and based on the SWOT analysis, the identified improvement areas are:

- Lack of data on the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients in their general health status.
- Need to improve the disease self-management by patient and their caregivers.
- Unresolved continuity of care between care levels (inter / intra level).
- Lack of coordination between healthcare and social services.

After the consensus meeting, "Lack of data on the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients in their general health status" was chosen as the main one and, therefore, that we should to focusing on.

Thus, the aim of the intervention is the assessment of the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients, within the framework of the Andalusian Public Health System strategies and plans (mainly 'The Comprehensive Healthcare Plan for Patients with Chronic Diseases' and 'The Integrated Care Process -Healthcare for Multimorbidity Patients-'), and within the scope of the Andalusian primary healthcare centers.

Then, the component of the Integrated Care Model for Multimorbidity (ICMM) that will be targeted is Component-4: individualized care plans[42]. This component will be implemented in primary care centers, taking into account that the cornerstone of the Andalusian health policy is centered in primary healthcare, intra-level coordination and continuity of care.

The target population selected for the implementation is composed by complex chronic patients (patients with chronic severe health problems, multimorbidity and polypharmacy) that meet the criteria established in the document "Integrated Care Process 'Healthcare for Multimorbidity Patients'"[43] (including disease patterns, physical function, mental health, and socioeconomic status among others) and priotized according to the rules established in the guideline "Individualized care plans for patients with multimorbidity or with complex health needs. Recommendations for its drawing up"[44].

CSJA and SAS will perform the intervention on a 200 patients sample size.

The core team members that will be involved in the pilot implementation are:

- Ana M. Carriazo, MD and PhD (CSJA). Senior Advisor at the Regional Ministry of Health of Andalusia and in charge of International affairs of the Regional Minister. Specialist in Preventive Medicine and Public Health and expert in Statistics. Responsible of coordinating of the Andalusian WP6 pilot implementation.
- Inmaculada Cosano Prieto, MD (SAS): Director of the Comprehensive Plan for Integrated Care for Patients with Chronic Diseases of Andalusia. Director of the Primary Health Care Centre of La Rinconada (Sevilla Norte Health District, Spain). Previously she has been Deputy Medical Director of the Virgen del Rocio Hospital and before, Deputy Director for Health Promotion and Participation at the General Secretary for Public Health, Regional Ministry of Health of Andalusia.
- Juan José Bedoya Belmonte, MD and PhD (SAS): Director of the Primary Healthcare Centre "Tiro de Pichón" at the Málaga Primary Healthcare District (Málaga, Spain).
- Rafael Rodríguez Acuña, PhD (FPS). International project manager, technical advisor and researcher.

The core team members will be supported by trainers, primary healthcare as well as information systems professionals.

Patients will be selected in order to ensure that the final sample will be representative.

[42] K. Palmer et al. Multimorbidity care model: Recommendations from the consensusmeeting of the Joint Action on Chronic Diseases and PromotingHealthy Ageing across the Life Cycle (JA-CHRODIS).Health Policy 122 (2018) 4–11

[43] Proceso Asistencial Integrado 'Atención a pacientes pluripatológicos' [The Integrated Care Process 'Healthcare for Multimorbidity Patients].

[44] Plan de Acción Personalizado en pacientes pluripatológicos o con necesidades complejas de salud. Recomendaciones para su elaboración [Individualized care plans for patients with multimorbidity or with complex health needs. Recommendations for its drawing up].

Patient's Health information will be collected from the electronic health care record stored in the corporate system at the Andalusian Health Service.

For achieving the aim of the pilot, the proposed activities (Change package) are listed below:

- Complex chronic patients sample selection.
- Drawing up and delivering the Individualized care plans.
- Patients follow-up.
- Data collection at patient's electronic health care record.
- Applying for, and obtaining approval, for retrieving patient's health information stored in the Andalusian Health Service's corporate IT system.
- Data analysis.

The achievement of these activities will be monitored through the following key performance indicators:

- Number of patients included in the sample (target: 200 patients).
- Number of health districts represented in the sample (target: 8).
- Drawing up and delivering the Individualized care plans (Y/N).
- Outcome assessment report (Y/N), including, at least, the number of recruited patients, number of individualized care plans, and the rate of unplanned hospitalisation potentially preventable achieved (%) in 12 months.

7. Study of the Intervention

The Regional Ministry of Health of Andalusia has supported the introduction (within the Andalusian public healthcare system) of an Integrated Care Model intended to patients with chronic diseases. However, a comprehensive assessment of Individualized care plan implementation is needed to check whether the multimorbid patient's health status improves or not.

Thus, the aim of the intervention is the assessment of the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients, within the framework of the Andalusian Public Health System strategies and plans, and within the scope of the Andalusian primary healthcare centers. Then, the component-4 (individualized care plans) of the ICMM has been selected to be implemented.

Therefore, a sample of 200 multimorbid patients will be selected and followed up for 12 month. For assessment of the effect of agreed individualized care plan on multimorbid patients' health status, health data will be analysed in an aggregated way. The approach that will be used to establish whether the observed outcomes will be due to the intervention will be the comparison of multimorbid patients health status during 12 months.

Qualitative information gathered in different questionnaires that are applied to patients in the existing programmes will be carefully reviewed in order to assess patient's experience during the intervention.

8. Measures

In 2016 the Spanish Ministry of Health, Social Services and Equality released a report entitled "Proposal of indicators for the assessment of multimorbid patients care in the framework of the strategy for tackling the chronicity within the Spanish National Health System". The report states 11 indicators for the assessment of multimorbid patients care plans, classified according to its typology and main usefulness. Hence, and taken into account the Andalusian own strategies and plans, "unplanned hospitalisation potentially preventable" has been selected as main outcome indicator of the intervention. The report also highlight that this indicator is considered a suitable for the assessment of intermediate results (use and suitability of the multimorbid patients care plans) of the implementation of multimorbid patients care plans within the Spanish system of Autonomous Communities.

Therefore, the approach that will be used for the assessment whether the observed outcomes will be the comparison of the unplanned hospitalisation potentially preventable in multimorbid patients, before and after the application of individualized care plan. The result will be expressed as rate of unplanned hospitalisation potentially preventable achieved (%) in 12 months.

- Key Performance Indicator of the Collaborative methodology
    - Number of health districts participating in the pilot (target: 8).
    - Number of patients included in the sample (target: 200 patients).
    - Drawing up and delivering the Individualized care plans (Y/N).
    - Outcome assessment report (Y/N), including, at least, the number of recruited patients, number of individualized care plans, and the rate of unplanned hospitalisation potentially preventable achieved (%) in 12 months.

9. Chronogram

- Information of pilot study among Andalusian Health Service professionals. Sep-Oct 2018
- Complex chronic patients sample selection. Oct 2018 – Jan 2019
- Drawing up and delivering the Individualized care plans. Oct 2018 – Jan 2019
- Patients follow-up. Oct 2018 – Dec 2019
- Data analysis. Oct 2019 – May 2020

5.2. IACS. Aragon Primary Care

1. Problem Description

In Spain, Primary Care serves as the gatekeeper of patients into the healthcare system. However, multimorbid patients, who represent around 80% of the population aged ≥65 years in the region of Aragón, navigate within the healthcare system once inside it, potentially leading to fragmentation of care. The lack

of continuity of care may, in turn, enhance the negative impact on health of multimorbidity, resulting in higher mortality, unexpected or inappropriate use of health services (e.g., increased number of hospitalizations, early readmissions), increased risk of inadequate polypharmacy, interactions, adverse drug reactions and low adherence. This finally results in poor quality of life and unnecessary increased public health costs.

The fragmentation of care is potentially due to lack of integration between primary and hospital care services and among different specialties, and to the need for a figure acting as a case manager of the patient who knows her/his entire clinical and social context and ensures a patient-centred approach and an individualized intervention plan. Moreover, although Spanish healthcare professionals are very 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 and to adopt patient-centred care and shared-decision making taking into account patient´s preferences, needs and expectations. Training needs of professionals on managing multimorbidity have been previously identified in the context of a Spanish multi-centre randomized clinical trial that assesses the efectiveness of a complex intervention in Primary Care to improve medication appropriateness in multimorbid patients, and are in line with those identified in the systematic review conducted by Lewis et al.45.

In Spain, the Strategy to Address Chronicity in the National Health System was launched in 201246. This Strategy encompasses 101 recommendations established towards a change in the focus of the care system that guarantees continuity of care; adapts to the evolution of the disease in the patient; and favors his personal autonomy. At regional level, among others, we have a Strategy to Handle the Patient with Polypharmacy in Aragón, focused on patients aged 75 years and over. The Government of Aragón has also recently released the Aragón Health Plan for 203047, which defines a specific action line aimed at improving population health at all stages of life and another to guide health system towards person-centred care, and recognises that virtually all policies have impact on health. A Strategy for Complex Chronic Patient Care was also launched in 2017 and it is being developed at present, but it is not implemented yet in many health centers.

The health status of general population in Aragón in terms of prevalence of multimorbidity, polypharmacy and specific chronic conditions, as well as the use of health services, has been described in the EpiChron Cohort48, highlighting that multimorbidity is suffered by a high percentage of the population. Multimorbidity was found to be strongly related to the occurrence of adverse drug events, as far as it requires the intervention of different specialists and the prescription of multiple medications. The nature and impact of comorbidities in patients with a given chronic disease has also been investigated. The coexistence of mental comorbidity in patients with type 2 diabetes was shown to increase the number of

[45] Lewis C, Wallace E, Kyne L, Cullen W, Smith S. Training Doctors to Manage Patients with Multimorbidity: A Systematic Review. J Comorbidity. 2016, 2: 85-94. doi: 10.15256/joc.2016.6.87

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unplanned hospital admissions, and discordant comorbidities had an important effect on specialist care use. This situation makes it necessary to adopt organizational, healthcare and formative measures in our regional healthcare system to minimize the fragmentation of care suffered by multimorbid patients and to improve health professionals´ skills to manage multimorbidity.

2. Available knowledge

Multimorbidity is a growing phenomenon in most European countries, not only in the elderly but also in adult and young population. Multimorbidity is starting to be considered as a Public Health issue because it represents a daily challenge for health systems and healthcare providers, it has a negative impact on health outcomes and increases health costs. It has been translated into a great effort during the recent past years to conduct research to characterize de epidemiology and impact of multimorbidity, and to develop guidelines and models of care for patients with multimorbidity. The European Commission launched in 2013 the Join Action Chrodis to respond to the problem of chronicity and multimorbidity resulting in the development of a multimorbidity care model49. In another framework, the Ariadne principles were designed in 2014 to handle multimorbidity in primary care consultations50. The National Institute for Health and Care Excellence also developed in 2016 the NICE guidelines for clinical assessment and management of multimorbidity51. More recently, in 2017, the Academy of Medical Sciences released a report in which multimorbidity is considered a priority for global health research, and give clues about what is already known about the problem, and which gaps of knowledge still remain unanswered52.

At national level in Spain, we coordinate the Multi-PAP multicentric randomized clinical trial to measure the effectiveness of a complex intervention for improving drug prescription in primary care patients with multimorbidity and polypharmacy53. This intervention is based in part in the Ariadne principles and promotes training of healthcare professionals in multimorbidity, polypharmacy and patient-centred care, and shared-decision making. A standardized educational online tool for healthcare professionals called e-MultiPAP has been developed as a result of the project.

3. Rationale

[49] Palmer K, Marengoni A, Forjaz MJ, Jureviciene E, Laatikainen T, Mammarella F, et al. Multimorbidity care model: Recommendations from the consensus meeting of the Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle (JA-CHRODIS). Health Policy (New York) [Internet]. 2018 Jan [cited 2018 Jul 31];122(1):4–11. Available from: http://www.ncbi.nlm.nih.gov/pubmed/28967492

[50] Muth C, van den Akker M, Blom JW, Mallen CD, Rochon J, Schellevis FG, et al. The Ariadne principles: how to handle multimorbidity in primary care consultations. Vol. 12, BMC Med. 2014. p. 223.

[51] National Institute for Health and Care Excellence. Multimorbidity: clinical assessment and Multimorbidity: clinical assessment and management management NICE guideline [Internet]. 2016 [cited 2018 Jul 31]. Available from: https://www.nice.org.uk/guidance/ng56/resources/multimorbidity-clinical-assessment-and-management-pdf-1837516654789

[52] The Academy of Medical Sciences. Multimorbidity: a priority for global health research [Internet]. London; 2018 [cited 2018 Apr 24]. Available from: https://acmedsci.ac.uk/file-download/82222577

[53] Prados-Torres A, del Cura-González I, Prados-Torres D, López-Rodríguez JA, Leiva-Fernández F, Calderón-Larrañaga A, et al. Effectiveness of an intervention for improving drug prescription in primary care patients with multimorbidity and polypharmacy: Study protocol of a cluster randomized clinical trial (Multi-PAP project). Implement Sci. 2017;12(1).

This intervention is based on the Integrated Care Model for Multimorbidity developed in the Joint Action Chrodis[54] which represents a theoretical framework with several components that should be taken into account when managing multimorbid patients in the clinical practice. It is expected to work because it has been developed by a multidisciplinary team of internationally recognised experts who are researchers and clinicians with expertise in multimorbidity. Although in a perfect scenario it would be ideal to implement the 16 components of the model, it has not been created to necessarily address all the items at the same time. Moreover, the components can be addressed or interpreted in different ways, converting this model into a flexible tool which is adaptable to the peculiarities, characteristics and objectives of each implementing site.

On the other hand, the training in multimorbidity proposed as part of the intervention is based on the Ariadne principles[55]. These principles represent a theoretical framework to handle multimorbidity in primary care consultations, and they are based on the sharing of realistic treatment goals by physicians and patients, which result from i) a thorough interaction assessment of the patient's conditions, treatments, constitution, and context; ii) the prioritization of health problems that take into account the patient's preferences - his or her most and least desired outcomes; and iii) individualized management realizes the best options of care in diagnostics, treatment, and prevention to achieve the goals. The training course has been previously tested in family physicians in two previous editions and it has been shown to overall increase knowledge on multimorbidity.

4. Specific aims

The intervention aims to address the problem of managing multimorbid complex patients in Primary Care to reduce the potential impact of multimorbidity on health outcomes. With this project we want to address this issue by the implementation of two types of measures in accordance to the Integrated Care Model for Multimorbidity designed in the Joint Action CHRODIS. On one hand, the implementation of educational measures to train healthcare professionals to improve their skills in multimorbidity and patient-centred care to manage multimorbidity in clinical practice. On the other hand, the implementation of organizational measures to improve the continuity of care avoiding cares fragmentation among different professionals and healthcare levels.
The main aim of the project is to study the feasibility of implementing this type of measures in a real context, and to decrease the impact of multimorbidity in health outcomes in patients aged 65 years and over with multimorbidity and polypharmacy. With this report we want to present the pilot action plan that will be followed to implement part of the multimorbidity care model in Aragón, including our context, the main objectives, and the specific actions to be implemented.

5. Context

[54] Palmer K, Marengoni A, Forjaz MJ, Jureviciene E, Laatikainen T, Mammarella F, et al. Multimorbidity care model: Recommendations from the consensus meeting of the Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle (JA-CHRODIS). Health Policy (New York) [Internet]. 2018 Jan [cited 2018 Jul 31];122(1):4–11. Available from: http://www.ncbi.nlm.nih.gov/pubmed/28967492

[55] Muth C, van den Akker M, Blom JW, Mallen CD, Rochon J, Schellevis FG, et al. The Ariadne principles: how to handle multimorbidity in primary care consultations. Vol. 12, BMC Med. 2014. p. 223.

The strengths identified show in general that Primary Care is the more appropriate healthcare level to conduct an intervention for adressing multimorbity, because it is the gateway to the healthcare system, it is well implanted, and primary care teams are multidisciplinary, they work as a team and they are the main contact or reference point of patients during the process of care. Among the main weaknesses, we have to note that there is not enough culture of coordination between different healthcare levels with frequent conflicts of roles, and that the information of the patient is not integrated and shared between healthcare levels as much as needed. Moreover, health professionals unaware of the relevance of the multimorbidity phenomenon and they are not sufficiently trained to manage it in clinical practice. As the main opportunities detected in our context, we can highlight the existence of a strategy for chronicity in our region, the availability of a validated standardized educational tool on multimorbidity which has been shown to increase knowledge on multimorbidity in family physicians, and the existence of a culture of alignment among the research group involved in Chrodis-Plus, policy makers and Primary Care professionals. Finally, the main threats identified for the success of the intervention are the possible resistance to change of some care settings and/or professionals, the existence of a hospital-centrism culture, the limited economic and human resources, the possibility of a lack of acceptability of the educational tool by health professionals, and potential political instability during the implementation process. As a summary of the SWOT analysis we can say that, although we have internal weaknesses and there are some external threats, at this moment the strengths and opportunities and superior so that most threats can be seen as opportunities and weaknesses as possibilities for improvement. This situation places us in a competitive position with a realistic project in the medium- and long-term.

To overcome the weaknesses and threats identified in our local context, we have selected the following improvement areas for the implementation of the integrated care model for multimorbidity, which are ordered from highest to lowest priority:

1. Training of healthcare professionals to adequately manage multimorbidity in clinical practice from a patient-centred focus by means of a standardized educational online tool specifically designed by and for health professionals.
2. Fragmentation of care among healthcare professionals and levels suffered by multimorbid patients in the clinical practice. Improvement of continuity of care by means of redefining the role of the multidisciplinary primary care team, the identification of this team as case manager for each patient, and the conformation of a specific care unit in the hospital to facilitate the direct communication between Primary and Hospital Care.
3. Integration and sharing of relevant clinical information of patients among health professionals from Primary and Hospital Care through the development of a module for gathering specific information to be included in the software of EHRs, and the development of a consultation system to consult professional experts.
4. Comprehensive assessment of multimorbid patients from a patient-centred perspective, focusing on assessment and proactive follow-up of his/her needs and their translation into an individualized care plan.

6. Intervention

- *Description of the LIWG*

The LIWG is formed by a total of 34 stakeholders. There are 4 organizers from IACS who run the secretariat, 2 decision makers from the Government of Aragón who provide strategic vision and facilitate the communication with relevant contact persons. A total of 19 experts from different institutions inside and outside of Aragón provide their knowledge on training health professionals in multimorbidity. Up to 10 implementers will be in charge of implementing the intervention following the agreed plan. Some of them are also front-line stakeholders who give knowledge and expertise on real-life practice experience. Finally, a representative of patients to give input during the pilot action development, implementation and evaluation joint the team from the Aragón Health Council.

- The intervention will consist in:
  - Development of an online 5-week training course on multimorbidity, polypharmacy and patient-centred care (e-MultiPAP) designed by and for health professionals, which has been validated in the context of a national
  RCT.
  - Definition of the team acting as a case manager of the patient conformed by the family physician and the nurse.
  - Definition of the personnel of reference for chronic patients at specialized care level at a chronic care unit depending of the Internal Medicine Service to which patients seen in primary care can be directly derived for specific consultations, procedures and/or tests.
  - Development of a virtual interconsultation system to consult professional experts outside the Primary Care team.
  - Development of a module of information to be shared among professionals and integration in the Primary Care EHRs.
  - Development of an individualized care plan at patient level based on the comprehensive assessment by the primary care team taking into account patient´s needs and preferences, and proactive follow-up of patients. The comprehensive assessment will include clinical, care needs, functional, cognitive, socio-sanitary and pharmacological assessments, using specific tools/questionnaires such as the Virginia Henderson model, the Barthel index, the Lawton Brody scale, the Lobo´s Mini Cognitive Exam, or the sociofamiliar scale of Gijón.

- Application of stratification strategies:

  The target population for the intervention will be formed by patients aged ≥ 65 years with multimorbidity (≥ 2 chronic diseases) and polypharmacy (≥ 5 chronic drugs). They will be recruited from different Primary Care Health Centres of Aragón coming from the Aragon Complex Chronic Patient Care Program.

- The components of the Integrated Care Model for Multimorbidity targeted will be:
  - Delivery of the care model system: through a *Regular comprehensive assessment of patients* leading to the creation of *Individualized care plans*, and by the identification of a *Professional team appointed as coordinator of the individualized care plan and contact person for patient and family ("case manager")*.
  - Decision support: by *Training members of the multidisciplinary team* in multimorbidity, and by *Developing a consultation system to consult professional experts* through a virtual interconsultation system.

- Self-management support: also by *Training of care providers to tailor self-management support based on patient preferences and competencies,* and in *Shared decision making (care provider and patients)*.
- Information systems and technology: through the *Exchange of patient information between care providers and sectors by compatible clinical information systems* by developing and integrating a module in the software used to register patient electronic medical records to register additional clinical and social information and to exchange this information between care providers.

7. Study of the Intervention

- Approach chosen for assessing the impact of the intervention(s) (quantitative or qualitative analysis):
  For assessing the impact of the intervention we have opted for a quantitative analysis. Further, a qualitative analysis using the ACIC questionnaire will be performed. Although a qualitative analysis using the PACIC questionnaire and/or focus groups would have been desirable in order to know the perception of patients about the intervention, it would be very time consuming and this idea was finally discarded.
- Approach used to establish whether the observed outcomes were due to the intervention(s):
  The peculiarities of our intervention, which tries to test a theoretical model to manage multimorbidity by implementing a number of specific actions, makes it difficult to establish whether the observed outcomes were due to our intervention. In contrast, we aim to test the feasibility of the implementation of the multimorbidity care model in real life conditions in a primary care setting in Spain. The actions to be implemented are complex and it is impossible to measure their direct impact on specific results or outcomes, which may be influenced by several factors or by their global joint effect. In case of training of healthcare professionals, we can assume that the increment of knowledge on multimorbidity would be mainly due to the realization of the training course.

8. Measures

The key performance indicators selected for each of the specific actions of the pilot action plan are listed below, distinguishing between outcomes (O) and process (P) indicators. They have been chosen according to the feasibility of collecting them in clinical practice.

- Existence of a document describing the functions/role of the case manager: Y/N. P
- Percentage of patients included in the program with case manager identified. P
- Number of Primary Care teams included in the program. P
- Implementation of a chronic care unit at the hospital: Y/N. P
- Identification of personnel of reference at hospital´s chronic care unit: Y/N. P
- Number of admissions to the emergency room in 12 months. O
- Number of hospitalizations in 12 months. O
- Number of avoidable hospitalizations in 12 months. O
- Number of health professionals who accept to do the training course and start it. P
- Number of health professionals who finish the training course. P
- Increment of knowledge as the difference of mark in a test on skills in multimorbidity done before and after the training course. O
- Satisfaction of the training course by health professionals (mark given to the course). O
- Number of interconsultations/patient. O

- Number of interconsultations in 12 months. O
- Percentage of interconsultations to professional of reference/total consultations to all specialties. O
- Percentage of response to interconsultations in less than 48 h. P
- Existence of a module of information shared among professionals in the EHRs: Y/N. P
- Percentage of patients with individualized care plan based on a comprehensive assessment. O
- Number of visits to Primary Care team per patient in 12 months. O

- *Key Performance Indicator of the Collaborative methodology*

  The key performance indicators of our intervention will be the increment of knowledge as the difference of mark in a test on skills in multimorbidity done before and after the training course, and the satisfaction of the training course by health professionals as their mark given to the course, since training of professionals is the more important dimension to be addressed in our intervention.

9. Chronogram

- Development of an online 5-week training course on multimorbidity, polypharmacy and patient-centred care (e-MultiPAP) designed by and for health professionals, which has been validated in the context of a national RCT: The course will be offered to health professionals in October-November 2018.

- Definition of the team acting as a case manager of the patient conformed by the family physician and the nurse: It will be performed during October 2018-February 2019.

- Definition of the personnel of reference for chronic patients at specialized care level at a chronic care unit depending of the Internal Medicine Service to which patients seen in primary care can be directly derived for specific consultations, procedures and/or tests: It will be performed during October 2018-February 2019.

- Development of a virtual interconsultation system to consult professional experts outside the Primary Care team: This system will be operative in October 2018 and used throughout the intervention until October 2019.

- Development of a module of information to be shared among professionals and integration in the Primary Care EHRs: This module will be operative in October 2018 and used throughout the intervention until October 2019.

- Development of an individualized care plan at patient level based on the comprehensive assessment by the primary care team taking into account patient´s needs and preferences, and proactive follow-up of patients: The development of the individualized care plan of patients will start in October 2018, and the follow-up will last until the end of the intervention in October 2019.

5.3. *UCSC. Multimorbidity Care Model in elders with dementia and adults with intellectual disability*

1. Problem Description

Worldwide health care systems are currently facing the significant and growing challenge of multimorbidity, defined as the co-occurrence of multiple chronic diseases in a single patient.

Chronic disease management has been identified as a key health system concern among developed countries given the rising prevalence and burden of chronic illness high[56,57,58], affecting more than 60% of people aged 65 or older[59]. According to the World Health Organization, chronic diseases have reached epidemic proportions and constitute the leading causes of death in the world[60] and, as a result, effective and efficient long-term management of multiple comorbid chronic diseases is one of the greatest health-related challenges that patients, health professionals, and, more broadly, societies who fund health care services are facing nowadays[61].

Multimorbidity poses substantial difficulties for health care policy and resource allocation decision making, due to imperfect information, aging populations, and increasingly undesirable societal lifestyle characteristics. Reducing the burden of chronic diseases such as diabetes, cardiovascular disease, cancer and mental disorders is therefore a priority for EU Member States and at the EU Policy level, since they affect 8 out of 10 people over the age of 65 in Europe, for a total cost of €115 billion or 0.8% of GDP annually, approximately 70% to 80% of healthcare budgets across the EU[62].

In Italy, more than 1 million people are living with dementia[63]. Data concerning Down syndrome are scarse but prevalence of subjects with DS is estimated around 38000 individuals nationwide[64].

Particularly for elders with dementia and adults with intellectual disability there is a need to cope with complex health needs, multi morbidity and polypharmacy. In a usual care setting they often experience poor case coordination, and frequently don't have a reference care provider. This highly fragmented form of care, due to the current traditional disease-oriented approach, leads to incomplete, inefficient, ineffective, and possibly harmful clinical interventions[65].

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2. Available knowledge

In order to improve this condition, the attempts to develop solutions to the multimorbidity problem have been various. Following Cochrane Effective Practice and Organisation of Care (EPOC) methodology, all interventions could be categorized into either organizational (care and case management, nursing home, transitional care, and physical training) or patient-oriented (self-management, disease management, educational groups visits, and telephone health coaching). In several studies some improvements in clinical outcomes, satisfaction, health services use and cost outcomes were detected from both organizational and patient-oriented interventions[66].

However, evidence on the efficacy of care pathways for multimorbidity provide conflicting results, and there are no widely accepted care models for multimorbidity[67]. All these factors lead to a need to develop a system that works for multimorbidity to deliver good quality of care to these patients[68].

3. Rationale

To provide care to persons with multimorbidity, the Joint Action CHRODIS, performed between 2014 and 2017, developed a framework for care of patients with multimorbidity that potentially could be applied across Europe[69]. This framework identifies and included sixteen components across five domains (Delivery of Care; Decision Support; Self Management Support; Information Systems and Technology; and Social and Community Resources). However, this Integrated Care Model for Multimorbidity developed by the Joint Action CHRODIS needs to be assessed in practice and validated across different European healthcare settings.

In this setting, the Joint Action CHRODIS Plus (2017-2020) proposes to test the Integrated Care Model for Multimorbidity in pilot sites across Europe.

4. Specific aims

Aim of the pilot study is to improve case coordination, and provide patients with a reference care provider. This goals would be accomplished with the introduction in the care process of a case manager and the evaluation of patients with a comprehensive assessment tool that would include all clinically relevant domains and that could possibly assist health professionals and caregivers to spot undetected care needs . In particular, case-management proved its efficacy in decreasing the number of hospital (re)admissions and improving patient satisfaction. The health care of an older adult extends beyond the traditional medical management of illness. It requires evaluation of multiple issues, including physical, cognitive, affective, social, financial, environmental, and spiritual components. All these features have shown to influence an older adult's health and wellbeing. Comprehensive geriatric assessment (CGA) is defined as a multidisciplinary diagnostic and treatment process that identifies medical, psychosocial, and functional limitations of a frail older person in order to develop a coordinated plan and to maximize overall

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health. CGA is based on the premise that a systematic evaluation of frail, older persons by a team of health professionals may identify a variety of treatable health problems and lead to better health outcomes[70,71,72,73,74,75,76].

Another improvement area is the accessibility of care. This would be realized with the implementation of a technocare service. There is some evidence showing benefits of using eHealth[77,78,79,80]. For instance, using technocare, patients could overcome barriers for accessing healthcare services, benefit from better monitoring and continuity of care and improve self-care management and independent living at home.

Finally, involving patients and their families to improve self-management could result in better healthcare utilization and wellbeing. Providing options for patients and families to improve their self –management includes explaining their diagnoses, diseases, and medical conditions, as well as providing information on medication use, and training patients to use medical devices, supportive aids, and health monitoring tools correctly (for example, blood pressure and glucose monitoring tools etc). Family members should be included and family education should be encouraged where appropriate, with consent of the patient.

5. Context

Adequate care for individuals living with chronic illnesses calls for a healthcare system redesign, moving fr om acute, disease-centered to patient-centered models.

The present pilot study is going to be set up in a day hospital outpatient clinic in a teaching hospital in Rome. In our institution subjects with dementia and intellectual disability including Down syndrome are routinarily addressed. Frail elders and adults with ID usually present to medical attention with a plethora of multi morbid conditions. Evaluating the possibilities to improve the management of this target of patients, a multidisciplinary team has been created to propose, validate and then apply specific interventions in order to overcome the problems related to it. A SWOT analysis was performed with care providers. Among the strengths emerged the expertise and the strong motivation of the care providers, while the major weaknesses of the health organization were the long waiting lists and waiting times for patients.

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In fact, hampered by a lack of understanding of the medical process and misguided by unrealistic expectations of medical care, patients are rarely prepared to manage their own diseases. The physician-patient interaction give an opportunity to increase their involvement in the medical process, especially regarding treatment and follow up. Patients who do not use this opportunity actually may not acquire the knowledge, skill, and the confidence they need to manage their multimorbidity.

While evaluating the outpatient setting accesses, unnecessary referrals have been highlighted as a problem by the actors involved in the process of care, and at the same time are perceived as a necessity for a better care by the patients. This problem of accessibility of care is worsened by the difficulty to reach the structure, especially in a big urban context or for those living outside the Region, which pose serious problems on patient management and further aggravate patient's health, the care burden on families and the costs for the system.

Another relevant problem in chronic multimorbid patients is the fragmentation of care that they often experience. "Fragmentation" in healthcare delivery means the systemic misalignment of incentives, or lack of coordination, that results in inefficient allocation of resources or harm to patients. Fragmentation adversely impacts on quality, cost, and outcomes[81].

To try to solve those critical points and overcome identified weaknesses and threats, the work group selected the following areas of improvement:

- The use of technocare platforms already existing in the teaching hospital, but not yet implemented in the geriatric outpatient setting, to improve accessibility of care, making services more readily available or convenient for people with limited mobility, time or transportation options, improving communication and coordination of care among members of a health care team and a patient, and providing support for self-management of health care.
- The introduction of a case manager and a comprehensive geriatric assessment (CGA) to improve case coordination and reduce the fragmentation of care. The role of the case manager should be to coordinate the patient's care plan, manage care, arrange social support, facilitate the integrated care from the multidisciplinary team and also act as an essential contact point for the patient. CGA could be used to evaluate patients with a comprehensive assessment tool including all clinically relevant domains and possibly assisting health professionals and caregivers to spot undetected care needs
- Involvement of patients and family members in the process of care through the group meeting concerning approaches to strengthen patients' self-management and self-efficacy. Topics would include explaining their diagnoses, diseases, and medical conditions, as well as providing information on medication use, and training patients to use medical devices, supportive aids, and health monitoring tools correctly (for example, blood pressure and glucose monitoring tools etc.). Family members would be strongly encouraged to attend when appropriate, with the consent of the patient.

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6. Intervention

In our study we built the multidisciplinary team needed to evaluate and deliver treatment and care relating to the patient's functioning, impairments, and social support. The use of a multidisciplinary team is fundamental to address disease-specific needs, avoid fragmentation and ensure continuity of care. The objectives are to increase efficiency and accessibility of care by providing multidisciplinary care, both in terms of different professionals' roles. The team involved consists of 3 Geriatrician, a Neurologist, a Psychologist, a Nursing Coordinator, a Secretary, a Case manager, an Health Economist, the patient's GPs and the representatives of the patient associations.

The Geriatricians are responsible for overseeing care and making clinical decisions about treatment, supported by the case manager that is the primary contact point for the patient and family, representing a single entrypoint into the system. The case manager acts as coordinator between patients 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; moreover, he monitors continuity of care, follow-ups, and documentation. The presence of a case manager aims to increase accessibility to healthcare, and improve continuity and effectiveness of following the individualized care plan. To support this complex role we introduced a secretary that takes care of the administrative part of taking charge.

Neurologist and Psychologist give knowledge and expertise on real-life practice experience.The nursing coordinator continuously evaluates the implementation process.

The health economist supports the decision maker in the planning, preparation, presidency and management of group workshops, draws up reports and analyzes the collected data. The main stakeholders involved are GPs that are fundamental to guarantee patients' continuity of care, patient associations and family members who will intervene during the development, implementation, monitoring and evaluation of the pilot action.

The present pilot study is going to be set up in an day hospital geriatric outpatient clinic in Rome. Patients are usually from the territory, from the clinic or identified as Silver Code (frail elderly at risk of losing functional autonomy) from the emergency room and addressed to the DH or as discharge protected by other departments (for Acuti and Rehabilitation).

The day hospital represent a reference point for patients over 65 suffering from multiple pathologies (multimorbidity) during the exacerbation phase. In our clinic we address subjects with dementia and intellectual disability including Down syndrome. The day hospital takes care of 500 AD and 150 DS patient-years. Frail elders and adults with ID usually present to medical attention with a plethora of multi morbid conditions. They also have deficits in many "non medical" areas such as social life, mood, behavior, communication, self care.

From the first access, patients will be taken care of by the case manager, who will represent the main contact for patients and their relatives, granting an integrate approach to the care process. The case manager will contact the GPs, will plan the necessary exams, will prepare the documentation to be submitted to the attending physician or to the multidisciplinary team if needed, and will make appointments, planning the visits based on physician's indications. Moreover, periodic training meetings

are planned for patients and their families to improve self management with the intervention of the psychologist.

In our study we decided to implement the following component of the Integrated Care Model:

- Case manager
- Patient-operated technology allowing patients to send information to their care providers
- Regular comprehensive assessment of patients operated also by a multidisciplinary, coordinated team
- Providing options to improve self-management

Aim of the pilot study is to improve case coordination, and provide patients with a reference care provider. This goal would be accomplished with the introduction in the care process of a case manager.

To achieve this goal is necessary:

- Identify the role of case manager (goals and protocol)

Ex.goals: Coordinate the patient's care plan, manage care, arrange social support, facilitate the

integrated care from the multidisciplinary team and also act as an essential contact point for the patient.

Ex. workflow: (ADexample): 1. first contact; 2. First visit with Doctor+Blood+ECG+NPS; 3. Second visit with Neuro+results+imaging; 4. FU on first contact*fixes the appointment for the first visit + provides the "impegnativa" for the ambulatory neuroimaging + fixes the appointmen", enrolls the patient for technocare.

- Identify the health professional
- Provide training for case management

Another improvement area is the accessibility of care. Services will be more readily available or convenient for people with limited mobility, time or transportation options. This would be realized with the implementation of a technocare service by:

- Create a Convenient and Effective Work Environment (work station)
- Define technocare procedure including eligibility criteria.
- Prepare informed consent module
- Identify a Full Time Coordinator(s)
- Do pre-training calls to assure attendance

Moreover, the evaluation of complex patients should be standardized through the routine use of comprehensive geriatric assessment tools.

Evaluate patients with a comprehensive assessment tool including all clinically relevant domains and possibly assisting health professionals and caregivers to spot undetected care needs.

Patients with AD and DS will be routinely assessed with InterRAI-CA and InterRAI-ID tools respectively.

Furthermore in order to provide options for patients and families to improve their self –management we decided to envolve patients and family in process of care. This includes offering approaches to strengthen patients' self-management and self-efficacy, including explaining their diagnoses, diseases, and medical

conditions, as well as providing information on medication use, and training patients to use medical devices, supportive aids, and health monitoring tools correctly (for example, blood pressure and glucose monitoring tools etc).

Family members should be included and family education should be encouraged where appropriate, with consent of the patient.

Education should be personalized to the patients, consistent with their individualized care plans, taking into account their knowledge, educational level, health literacy, and functional aspects (such as whether they have visual problems or cognitive impairment, which might affect comprehension).

7. Study of the Intervention

Quantitative and qualitative analysis will be used to evaluate the impact of the interventions. Different key process indicators will be calculated to indirectly verify the impact of the improvement actions undertaken.

To establish whether the observed outcomes were due to the interventions and to measure the patients', families' and clinicians' appreciation and interventions effects on transition outcomes, a survey will be administered in the outpatient context at the start of the quality improvement intervention and 10 months after the rollout process. The survey will include closed questions and also open-ended feedback.

8. Measures

In order to verify the effects of the introduction of the case manager, the following key indicators will be measured:

- Reduction of unnecessary referrals (number of patients with AD and DS readmitted within 28 day/ number of patients with AD and DS).
- Reduction of accessibility in Emergency Department (ED) and subsequent hospitalizations (number of ED admission for patients with AD and DS/ number of patients with AD and DS)

The Hospital Readmission Rate provides information on the number of patients that return to the hospital within a short period of time after being released. It is one of the most important healthcare metrics as it provides a great insight on the quality of care administered in the facility concerned. The lowest readmission rate is, the better. High rates point out dysfunctionalities that must be addressed as soon as possible.

- Percentage of drop-outs (number of missing appointments by patients with AD and DS/ number of fixed appointment for patients with AD and DS) calculated as an index for poor coordination of care.

To evaluate the utilization of the technocare platform it will be calculated:

- Average number of contacts recorded in the reference period: 12 months
- Percentage of extra contacts for Lazio region (number of extra region patients with AD and DS/ number of patients with AD and DS)

These two key indicators make it possible to know the volume of accesses (quality index) noted by the introduction of the technocare service.

- Percentage of drop-outs (Percentage of patients with AD and DS who disattend the fixed technocare appointment/ number of patients with AD and DS who fixed technocare appointment)

- Percentage of rescheduled techno visits (Percentage of rescheduled visits for patients with AD and DS/ number of patients with AD and DS who fixed technocare appointment

These measures can represent an index of service quality.

At the end, to understand the compliance to the self-management improvement programme it will be measured:

- Number of patient with AD and DS that participate at the group meeting

To analyse intervention appreciation by stakeholders (patients and care providers) a questionnaire will be administered.

Stakeholder's satisfaction is a great healthcare KPI example that should be a top priority for any healthcare organization, in order to have feedback and improve the service. Such assessment will provide insights on the overall perception of the hospital services and show which points can be improved. Besides, patients will feel listened to as their opinion and feelings are taken into account, which is another important component of the satisfaction score.

9. Chronogram

Based on the improvement areas that you identified in the previous step, please design the Pilot action plan:

a) Describe the improvement area

b) Define the objective (s)

c) List the activities (Change package), that you find necessary and feasible to reach the objective(s)

d) Identify the person(s) involved and the one that is responsible

e) Define timeline for all the activities

f) Define the Key performance indicator(s)

You may define elements of pilot action plan from the focus of all of the criteria, or only the selected criteria that you find the most useful. However, report also arguments, why other criteria were not seen as useful.

Please note:

- Several improvement areas may have the same objectives
- It would be advisable that Pilot action plan includes maximum 2 objectives
- The same objective may be related to more improvement areas and to several different criteria
- Each objective may have one or more related activities in the change package

5.4. Kauno Klinicos

1. Problem Description

According to the information of the National Institute of Hygiene, in 2013 chronic diseases accounted for 83% of all deaths in Lithuania with the highest prevalence of cardiovascular diseases by 56% and cancer by 19%. At the age of 65 and over, the prevalence of multimorbidity in the Lithuanian population was 42% and at the age of 85 it was above 62%. Even more, related results revealed more than 10% of the population already having at least two chronic conditions at the age of 45 and over[82] .

In Lithuania, primary care and specifically family physicians have to navigate patients through healthcare system, however patient with chronic diseases often being sent from one specialist to another, leading to possible fragmentation of care. The delivery of the primary care for MM patients is not coordinated and is based on disease-specific guidelines.

The integration for MM patients is lacking in all health care levels primary, secondary and tertiary. The team work in primary care level is missing and the primary health care level is mainly provided by family physician. The nurses' role is not clarified and their functions are being duplicated by family physician[83]. The main health care provider in this level is family physician, being responsible for all: physical, mental ant health care. The system needs a new case manager, aiming to support the coordination of patients and orientation towards his needs. Newly presented advanced nurse practitioner may take a new case manager role and to perform consultations for the patients independently. In addition, the integrated care for patients with MM, as well as holistic approach and teamwork are missing. There is an obvious need for additional training for medical professionals, who are involved in MM patients care.

There is an obvious need to present a new collaboration model in the country and to perform the best care for multimorbid patients presenting holistic and patients' oriented care for multimorbid patients. In Lithuania we have problems due to high waiting times to get specialized consultations for the patients' and until now there is no possibility to make direct doctor- doctor consultations, which negatively reflect to timely and complex problem solving. The integrated health care should presented for the health care professionals hopefully will reduce patients demands for more frequent and unplanned visits, as well for the total health care costs (reducing rehospitalisation, polypharmacy and etc.). The primary care of multimorbid patients need to be coordinated and managed in more efficient and effective way, decreasing a possibility of harmful clinical interventions and risk of inappropriate prescribing.

2. Available knowledge

The multimorbidity related problems were detail presented in CHRODIS project (http://chrodis.eu/our-work/05-health-promotion/wp05-activities/country-reports/).
The same problems are present within Lithuania as well. The incidence of chronic conditions is increasing with age, especially at age of 45-54 years and male gender. Majority of chronic conditions were related to heart, lung diseases, diabetes and cancer[84].

[82] Navickas, R., et al., Prevalence and structure of multiple chronic conditions in Lithuanian population and the distribution of the associated healthcare resources. Eur J Intern Med, 2015. 26(3): p. 160-8.
[83] Jaruseviciene, L., Liseckiene, I., Valius, L., Kontrimiene, A., Jarusevicius, G. and Lapao, L.V. 2013: Teamwork in primary care: perspectives of general practitioners and community nurses in Lithuania. BMC Family Practice 14, 118
[84] Navickas, R., et al., Prevalence and structure of multiple chronic conditions in Lithuanian population and the distribution of the associated healthcare resources. Eur J Intern Med, 2015. 26(3): p. 160-8.

The prevalence of multimorbidity globally is high[85] and increases with age, affecting more than 60% of people aged 65 or older[86]. There are only few examples of integrated care programs for chronic diseases implemented in relatively small populations[87]. Most of the interventions implemented have been multidimensional, including different components, but are poorly standardized. High quality of well-coordinated and shared health care approach may not only help to prevent more common GPs and specialists consultations, but also ensure a lower rate of hospitalizations, readmissions, emergency department visits for patients.

3. Rationale

The Joint Action CHRODIS developed a framework for care of patients with multimorbidity potentially applicable across Europe[88], the ICMM. This model identifies sixteen components across five domains: Delivery of Care, Decision Support, Self-Management Support, Information Systems and Technology, and Social and Community Resources.
This intervention will be based on a theoretical JA-CHRODIS framework with several components that should be taken into account when managing multimorbid patients in the clinical practice.
It is expected to work because it has been developed in collaboration with recognised experts who are researchers and clinicians with expertise in multimorbidity. Although it would be ideal to implement the 16 components of the model, it has not been created to necessarily address all the items at the same time. Moreover, the components can be addressed or interpreted in different ways, converting this model into a flexible tool which is adaptable to the peculiarities, characteristics and objectives of each implementing site.

4. Specific aims

General purpose of the interventions is to test the Integrated Care Model for Multimorbid patients in Lithuania.
By implementing Multimorbidity Care Model we aim to provide a better care for multimorbid patients and improve their quality of life, decrease the number of potentially avoidable hospitalizations and readmissions, to elaborate economical evaluation of the expenditure for the multimorbid patients.

Specific aims:

1. Reduce adverse outcomes related to the presence of multiple diseases, and the risk of drug-drug interactions by elaborating individualized integrated care plans.
2. Optimize treatment, maintenance and healthcare resources by coordinating individualized integrated care plan.
3. Maximize outcomes and increase continuity of care, while decreasing fragmentation and optimizing access to care and services through a case manager, who will intermediate between a patient and various members of the multidisciplinary team.
4. Provide doctor-to-doctor decision support in situations where further clinical support or knowledge is needed outside of the core team through a consultation system to be advised by professional experts.
5. Improve the patient's access to community resources, formal care, and patient associations, support groups, and psychosocial support by providing multidisciplinary care both in terms of different levels of

[85] Tinetti et a, 2012
[86] Barnett et al 2012, Melis et al, 2014, Marengoni et al, 2008, Marengoni et al, 2011
[87] Hopman et al, 2015
[88] Palmer et al. Health Policy 2018

the healthcare profession (nurses, physicians, physiotherapists, social workers etc.), and different disease specializations.

5. Context

Hospital of Lithuanian University of Health Sciences Kauno clinics is the largest health care institution in Lithuania. Kauno klinikos provides emergency medical care, in-patient hospital services and outpatient testing and services. All clinical departments are involved into practicing innovative medicine, while simultaneously being a clinical facility for teaching and research. Kauno klinikos employs more than 1200 physicians and 2400 nurses, who provide care according to the standards of evidence-based clinical practice. The hospital has 38 departments devoted to all medical and surgical specialties, including cardiovascular surgery, neurosurgery and organ transplant surgery. In recent years, the annual number of outpatient consultations increased significantly, exceeding 1.3 million visits and 95 thousand hospital admissions. All family physicians working in the Department of Family Medicine are experienced clinicians. The Department provides a comprehensive, holistic, and continuous care to patients and their family members. Family physicians can assume responsibility for the total health care needs of the individual and family, including medical, mental, social, and behavioural issues. Family health care center have a mental health care center and social worker, which will help to provide full scope of integrated services. The experts from cardiology, endocrinology and pulmonology department will be involved in the project as well, who will perform family physicians –specialist's consultations. The implementation process is going to be endorsed by the hospital administration, Lithuanian Bioethics Committee. Kauno klinikos is using Hospital e- database, which will be used in the study.

The weaknesses and threats mentioned in the SWOT analyses will be solved as follows: The lack of accessibility to family physician and specialist, lack of cooperation and confidence between specialist and family physicians (lack of cooperation) will be solved using direct family physicians - specialist consultations, i.e. multiconsiliums will be presented in the model. There will be a possibility to make distant consultations withuot the presence of the patients (currently the system do not have this possibility). Lack of teamwork (lack of education and practise) and fragmentation of health care: the psychosocial services are separated; this problem will be solved presenting teamwork principles in PHC level: newly presented case manager will be responsible for the coordination of the process and the psychosocial evaluation of the patients. Huge workloads may be reduced with the presentation of multidisciplinary team in PHC level, which may also may impact on the decrease of unnecessary visits to health care settings. The education for the medical personnel and the empowerment of a case manager, i.e. nurse, will be presented. The policy makers may be expected, though the vice-president of Ministry of health care is in the government board and it may impact the support of policy makers.

6. Intervention

The new integrated care model for multimorbid patient's will be implemented in one of the largest Lithuanian hospital: Kauno clinics Primary health care centre and Kaltinenai primary health care centre, which will represent rural area. Family physicians will be responsible for the selection of the patients (multimorbid, aged 45-70), their health care, polypharmacy management. The new role-for a case manager – will be identified (a nurse or advanced nurse practitioner) in primary health care level, who will be responsible for patient coordination and holsitic patients evaluation (including physical and psychosocial)

as well for the individualized health care plans performance with family physicians. In addition they will be responsible for primary multidisciplinary team organization upon patients' needs.
The Local Implementation Working Group is formed by experienced researchers and practicing physicians who both can provide knowledge and guidance through the process of the implementation.
More detail description of each member is in APPENDIX 2 and as follows:

1. The organizers group, who plan, prepare, chair and run the group workshops and agendas, write reports, administration. Assooc. Prof. administrator and family physician Ida Liseckiene, and the head of the Family medicine department - prof. Leonas Valius.
2. The experts group in primary health care level, who will implement the model in the practise as well: Ida Liseckiene (assoc. prof. MD, PhD, family physician, administrator of the Family medicine department), Leonas Valius (prof. MD, PhD head of the Family medicine department), Gediminas Urbonas (MD, PhD, family physician, experienced in clinical trials as principle investigator), Laimutis Gedminas (family physician, experienced in clinical trials as principle investigator, working in IT hospital team), Jurate Ezelskiene (advanced nurse practitioner, have experience in administration), Simona Kusleikiene (primary care psychiatrist, lecturer).
3. Kornelijus Andrijauskas (MD, PhD, family physician).
4. The experts group in secondary/tertiary level, who will also be implementers: Jurgita Plisiene (professor, MD, PhD, cardiologist, the head of ambulatory care in Cardiology department), Dzilda Velickine (prof.. MD, PhD, endocrinologist, the head of ambulatory care in Endocrinology department), Kristina Bieksiene (assoc. prof., MD PhD pulmonologist).
5. Two masters' students of advanced nursing, who will be responsible for the patient's questionnaires (social care and screening for mental health care problems): Ivona Ivasko and Ramute Miceviciene.

Description of the interventions:

The following interventions will be performed aiming to present our new integrated care model in the practise: one would be located in University hospital Kauno Klinikos (will represent city and public primary health care centre) and the other one will be located in Kaltinenai and will represent rural area, public health care centre.
All projects interventions are related to components across five domains: Delivery of Care, Decision Support, Self-Management Support, Information Systems and Technology, and Social and Community Resources).
The following interventions will be presented:

- Comprehensive assessment will be used to determine medical, psychological and functional capabilities of patients with multimorbidity in order to develop a coordinated and integrated care plan for multidisciplinary treatment and long-term follow-up of the patients.
- A case manager will act as an individualized care plan coordinator who intermediates between a patient and various members of the multidisciplinary team.
- Individualized plans will be based on the comprehensive assessment by a multidisciplinary team, including a patient-centred approach that considers preferences of the patients, and prioritization of cross-disease, holistic approach.
- A consultation system aims at providing decision support in situations where further clinical support or knowledge is needed outside of the core team.

- Options for patients to improve their self-management should be personalized and consistent with their individualized care plans.
- Supporting access to community and social resources enables improvement of the patient‘s access to community resources, formal care, and patient associations, support groups, and psychosocial support, and supports access to such services. The target population are patients with multimorbidity, which are treated at Kaunas University Hospital Kauno Klinikos, Family Medicine Center and public rural “Kaltinenu PHC center”. These patients are heavy users of the healthcare resources between 40 and 75 years of age having more than one chronic condition. Estimated number of patients is 200.
- Targeted components of the Integrated Care Model for Multimorbidity will be: regular comprehensive assessment of patients, multidisciplinary, coordinated team, professional appointed as coordinator of the individualized care plan and contact person for patient and family (“case manager”), individualized care plans, implementation of evidence based practice, training members of the multidisciplinary team, developing a consultation system to consult professional experts, providing options for patients and families to improve their self-management, shared decision making (care provider and patients), electronic patient records and computerized clinical charts, supporting access to community and social resources. Estimated number of patients is 200, i.e. MM patients, selected from primary health care clinics (in intervention sites), aged: 40-75 years with 2 and more chronic conditions at least from two following systems:
    - I I11 ; I20 ; I25 ; I50 ; I48
    - II E11
    - III E06.3 ; E89
    - IV J44; J45
    - V M05; M15-M19; M80; M81; M54
    - VI G54; G55

The results will be compared with the control group results which will be stratified according number and severity of diseases, patients’ age and gender.

7. Study of the Intervention

The assessment of the results will be done at the end of the project, through quantitative and qualitative measurements:

- Treatment optimization will be valued by the utilization of health resources: hospitalizations, hospitalizations by ambulatory care sensitive conditions, re-admissions in a given short period of time, visits to GP, to specialities.
- Satisfaction of multimorbid patient quality of health care will be assessed by questionnaire of „Patient Assessment of Chronic Illness Care“(PACIC); Quality of life/health status: EQ-5D Questionnaire.
- Focus group qualitative analysis of investigators. Focus group qualitative analysis for investigators“ nurses (group one) and doctors (group two). The focus group discussion will be used for doctors and nurses aiming to evaluate the problems regarding integrated care for patients with multimorbidity (before and after the pilot implementation).

- The key performance indicators include outcomes and process indicators for each of the specific actions of the pilot action plan:
  -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

8. Measures

EQ-5D questionnaire is a standardized instrument developed by the EuroQol Group as a measure of health-related quality of life that can be used in a wide range of health conditions and treatments. The descriptive system comprises five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. The EQ VAS records the patient's self-rated health on a vertical visual analogue scale. This can be used as a quantitative measure of health outcome that reflects the patient's own judgement. The scores on these five dimensions can be presented as a health profile or can be converted to a single summary index number (utility) reflecting preferability compared to other health profiles.
The Patient Assessment of Care for Chronic Conditions (PACIC) measures specific actions or qualities of care, congruent with the chronic care model (CCM), that patients report they have experienced in the delivery system. The survey includes 20 items, and should be sufficiently brief to use in many settings.
We are going to make a focus group qualitative analysis of investigators. The assessment is to be done by healthcare professionals before and after the implementation. The aim is to evaluate implementation success from the healthcare professional's perspective.
We will be monitoring and evaluating the utilization of health resources: hospitalizations, hospitalizations by ambulatory care sensitive conditions, re-admissions in a given short period of time, visits to GP, to the emergency room, to specialists.
The number and duration of hospitalizations, admissions to emergency room and avoidable hospitalizations in 12 months will be registered.

9. Chronogram

This implementation will be organized based on a 6-months run-in period, followed by a 12-months implementation period.

- Run-in period/Searching for multimorbid patients – from OCT (2018) to FEB (2020) (M14-M19)
- Selected patients observation – starts when firts patient is included - October (2018), end – FEB(2020).
- Each patient is observed for 1 year period (M14-M19)
  During observation period selected patients will fill: 1 time before the intervention and 1 time at the end of the phase: PACIC questionnaire, EQ-5D questionnaire, IPA and Mini mental as well HAD scales.
- A focus group qualitative analysis of investigators will be performed twice during the investigation time (in the beginning and at the end of implementation)

Multidisciplinary team establishment M14-M19

- Assess multiprofesional team training needs
- Produce the guidelines for the multidisciplinary team.
- Establishment Multidisciplinary team

- Train the multiprofesional team to the use of the guidelines

Case manager training M14-M19

- Assess the training need
- Consult with experts/WP partners and explore training alternatives
- Elaborate training program for case manager and other healthcare professionals, which should focus on the multimorbidity
- Train the case manager

Individualized care plans M14-M19

- Regular comprehensive assessment is done using standardized assessment tools where possible, along with a clinical interview.
- Assess the complexity of conditions including treatment burden, drug interactions, and disease patterns etc.
- Identify key aspects which will be used in any consequent care planning steps,
- Review and update individualized care plan during the regular subsequent assessments

5.5. *VULSK. Family Medicine Center, Primary care*

1. Problem Description

According to the information of the National Institute of Hygiene, in 2013 chronic diseases accounted for 83% of all deaths in Lithuania with the highest prevalence of cardiovascular diseases by 56% and cancer — by 19%. At the age of 65 and over, the prevalence of multimorbidity in the Lithuanian population was 42% and at the age of 85 it was above 62%. Even more, related results revealed more than 10% of the population already having at least two chronic conditions at the age of 45 and over[89]. Patients with multimorbidity have complex health needs but due to the current traditional disease-oriented approach, they face a highly fragmented form of care.

The design of care models for people with multimorbidity is becoming a priority for most health care systems, which are still mostly oriented toward acute instead of chronic diseases. As the care and treatment of multimorbidity patients is complex, it often involves a large number of healthcare providers and resources. In Lithuania, primary care and specifically family physicians have to navigate patients through healthcare system, however patient with chronic diseases often being sent from one specialist to another, leading to possible fragmentation of care. The delivery of the primary care for MM patients is not coordinated and is based on disease-specific guidelines. In a usual care setting patients often experience poor case coordination, and frequently don't have a reference care provider. The access to social and community resources are poor and the availability of these services is extremely variable. The main problem is that we don`t have data/information on patient's needs and expectations regarding their condition and barriers to care.

In conclusion, the primary care of multimorbid patients need to be coordinated and managed in more efficient and effective way, decreasing a possibility of harmful clinical interventions and risk of inappropriate prescribing.

2. Available knowledge

Study in Lithuania showed that the proportion of patients with MM falling into the 4th quartile of heavy reimbursed medications users starts to increase at the age of 41 years and this curve becomes neutral only at the age of 72. The prevalence of multimorbidity globally is high[90] and increases with age, affecting more than 60% of people aged 65 or older[91].

There is limited evidence on available integrated and multidimensional care pathways for patients with multimorbidity. There are only few examples of integrated care programs for chronic diseases implemented in relatively small populations[92]. Most of the interventions implemented have been multidimensional, including different components, but are poorly standardized. That`s why evidence on the efficacy of care pathways for multimorbidity provide conflicting results, and there are no widely accepted care models for

[89] Navickas et al., 2015
[90] Tinetti et a, 2012
[91] Barnett et al 2012, Melis et al, 2014, Marengoni et al, 2008, Marengoni et al, 2011
[92] Hopman et al, 2015

multimorbidity[93]. Previous studies showed a strong positive relationship between the risk of avoidable hospital admissions and the number of chronic conditions in individuals aged 65 or older.

To summarize, high quality of well-coordinated and shared health care approach may not only help to prevent more common GPs and specialists consultations, but also ensure a lower rate of hospitalizations, readmissions, emergency department visits for patients and help to optimize the healthcare resources.

3. Rationale

The Joint Action CHRODIS developed a framework for care of patients with multimorbidity potentially applicable across Europe[94], the ICMM. This model identifies sixteen components across five domains: Delivery of Care, Decision Support, Self-Management Support, Information Systems and Technology, and Social and Community Resources). This ICMM needs to be assessed in practice and validated across different European healthcare settings. VULSK team used variety of methods to understand and analyse the multimorbid patients' primary health care. In order to assess our practice that is participating in the implementation, we have identified our most relevant organizational characteristics before the implementation of the ICMM. (i.e., any initiatives that include activities aimed toward the attainment of defined objectives and targets for the care of people with multimorbidity). Each ICMM component was discussed by the experts, focusing on a) possible adaption to local setting, b) aims, c) key characteristics, d) target populations, and e) relevance for multimorbidity patients. We have identified relevant stakeholders and presented initial pilot action ideas to our Ministry of Health for their endorsement. Vilnius University hospital Santaros Klinikos in collaboration with University of Health sciences of Lithuania hospital, one of the biggest tertiary hospitals in Lithuania, for patients registered and selected with multimorbidity in primary health centre, determined which ICMM components would be most likely to affect local primary health care in Lithuania. Adapted ICMM model target the heavy users of the healthcare system and may be relevant to national policy makers when considering the needs and services related to the increasing population of multimorbid patients, and could also be referred to when rethinking and reshaping the integration between social and health care.

4. Specific aims

General purpose of the interventions is to test the Integrated Care Model for Multimorbidity in Lithuania. Based on local experience and knowledge determine country specific model version, fully adapted and specified for further local implementation.

By implementing Multimorbidity Care Model we aim to improve the quality of life, decrease the number of potentially avoidable hospitalizations and readmissions, to elaborate economical evaluation of the expenditure for the multimorbid patients.

Specific aims:

1. Reduce adverse outcomes related to the presence of multiple diseases, and the risk of drug-drug interactions by elaborating individualized integrated care plans.
2. Optimize treatment, maintenance and healthcare resources by coordinating individualized integrated care plan.

[93] Smith et al, 2012
[94] Palmer et al. Health Policy 2018

3. Maximize outcomes and increase continuity of care, while decreasing fragmentation and optimizing access to care and services through a case manager, who will intermediate between a patient and various members of the multidisciplinary team.
4. Provide doctor-to-doctor decision support in situations where further clinical support or knowledge is needed outside of the core team through a consultation system to be advised by professional experts.
5. Improve the patient‘s access to community resources, formal care, and patient associations, support groups, and psychosocial support by providing multidisciplinary care both in terms of different levels of the healthcare profession (nurses, physicians, physiotherapists, social workers etc), and different disease specializations.

5. Context

VULSK is one of the biggest teaching hospitals in Lithuania (1.967 beds) providing all levels of care in all medical fields 24/7. The pilot is going to be implemented in Family Medicine Center - primary care setting at Vilnius University Hospital Santaros Klinikos. The Centre of Family Medicine is comprised of Family Doctor Offices, Offices of Odontologist of General Practice and Tooth Prosthesis and Office of Primary mental health care. Services provided by the doctors working at the Centre of Family Medicine are available to everybody and encompass all groups of citizens, regardless of age, gender, social status or other factors. A family doctor is the first contact person, to whom the patients address their problems. A family doctor makes a decision regarding further care and treatment tactics for the patient. More detailed context is available in Appendix 4.

VULSK pilot site will implement the multimorbidity care model. The implementation process is going to be endorsed by the hospital administration, Lithuanian Bioethics Committee, decision and policy makers. This will help VULSK to overcome the limited human/economical resources while establishing multidisciplinary teams and implementing MCM components. Patient’s needs and expectations analysis regarding their condition and barriers to care will contribute to the establishment of specific guidelines for the management of MM patients’. VULSK experts in health economics, outcomes and management of non-communicable diseases will ensure the quality of the implementation processes. To overcome the identified weaknesses several training programs for healthcare professionals will be elaborated. The active involvement of social sector will encourage collaboration with local authorities and will keep the sustainable development of the model.

6. Intervention

The team consist of 13 different specialists who work at Vilnius University Hospital Santaros Klinikos and Vilnius University. The team include experts in Health Economics, Outcomes and non-communicable diseases Management, who both can provide knowledge and guidance through the process of the implementation.

a) the organizers group, who:

1) plan, prepare, chair and run the group workshops - Laimis Dambrauskas, Rokas Navickas
2) run the secretariat (prepare agendas and minutes) - Laimis Dambrauskas
3) write reports - Laimis Dambrauskas

b) the experts group, who:

1) provide knowledge and faculty on specific matters depending on the intervention selected - Vytautas Kasiulevičius (professor, researcher, family physician), Rokas Navickas (MD, PhD, cardiologist), Elena Jurevičienė(pulmonologist), Žydrūnė Visockienė (MD, PhD, endocrinologist)

c) the decision makers group, who:

1) provide strategic vision - Vytautas Kasiulevičius
2) support and sponsorship of the implementation process - Elena Jurevičienė
2) 3)eliminate bottlenecks during the implementation process- Rokas Navickas

d) the front-line stakeholders, who:

1) give knowledge and expertise on real-life practice experience - Lina Vencevičienė(VUHSK), Vytautas Kasiulevičius(VUHSK)
2) choose the right type of subject to implement - Kazys Simanauskas (VUHSK), Dalia Vasiliūnienė (VUHSK), Vencevičienė Lina (VUHSK), Vytautas Kasiulevičius(VUHSK)
3) Motivate and empower implementers - Elena Jurevičienė(VUHSK)
4) Equip and support implementers to deal with the implementation - Elena Jurevičienė(VUHSK)

e) the implementers group, who:

1) implement the intervention following the agreed plan - Vytautas Kasiulevičius(VUHSK), Lina Vencevičienė(VUHSK)
2) continuously assess the implementation process - Nomeda Minkevičienė(VUHSK), Aldona Kuporosova(VUHSK), Edita Licholip(VUHSK), Violeta Bičkauskienė(VUHSK), Eglė Vidūta(VUHSK)
3) provide input and feedback to the local implementation group - Laimis Dambrauskas(VUHSK), Kristina Švaikevičienė(VUHSK), Rokas Navickas(VUHSK)
4) consultation of representatives from the social sector - Eglė Vidūta(VUHSK)

Description of the interventions:

Comprehensive assessment will be used to determine medical, psychological and functional capabilities of patients with multimorbidity in order to develop acoordinated and integrated care plan for multidisciplinary treatment and long-term follow-up of the patients.

A case manager will act as an individualized care plan coordinator who intermediates between a patient and various members of the multidisciplinary team.

Individualized plans will be based on the comprehensive assessment by a multidisciplinary team, including a patient-centred approach that considers preferences of the patients, and prioritization of cross-disease, holistic approach.

A consultation system aims at providing decision support in situations where further clinical support or knowlegde is needed outside of the core team.

Options for patients to improve their self-management should be personalized and consistent with their individualized care plans.

Supporting access to community and social resources enables improvement of the patient‘s access to community resources, formal care, and patient associations, support groups, and psychosocial support, and supports access to such services. The target population are patients with multimorbidity that are treated at

Vilnius University Hospital Santaros Klinikos, Family Medicine Center and private family clinic "InMedica". These patients are heavy users of the healthcare resources between 40 and 75 years of age having more than one chronic condition. Estimated number of patients is 250.

Targeted components of the Integrated Care Model for Multimorbidity will be: regular comprehensive assessment of patients, multidisciplinary, coordinated team, professional appointed as coordinator of the individualized care plan and contact person for patient and family ("case manager"), individualized care plans, implementation of evidence based practice, training members of the multidisciplinary team, developing a consultation system to consult professional experts, providing options for patients and families to improve their self-management, shared decision making (care provider and patients), electronic patient records and computerized clinical charts, supporting access to community and social resources.

7. Study of the Intervention

The assessment of the results will be done at the end of the project, through quantitative and qualitative measurements:

- Treatment optimization will be valued by the utilization of health resources: hospitalizations, hospitalizations by ambulatory care sensitive conditions, re-admissions in a given short period of time, visits to GP, to specialities.
- Satisfaction of multimorbid patient quality of health care will be assessed by questionnaire of „Patient Assessment of Chronic Illness Care"(PACIC).
- Quality of life/health status: EQ-5D Questionnaire.
- Focus group qualitative analysis of investigators.

The key performance indicators include outcomes and process indicators for each of the specific actions of the pilot action plan:

- The number of unplaned 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.

8. Measures

EQ-5D questionnaire is a standardized instrument developed by the EuroQol Group as a measure of health-related quality of life that can be used in a wide range of health conditions and treatments. The descriptive system comprises five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. The EQ VAS records the patient's self-rated health on a vertical visual analogue scale. This can be used as a quantitative measure of health outcome that reflects the patient's own judgement. The scores on these five dimensions can be presented as a health profile or can be converted to a single summary index number (utility) reflecting preferability compared to other health profiles.

The Patient Assessment of Care for Chronic Conditions (PACIC) measures specific actions or qualities of care, congruent with the chronic care model (CCM), that patients report they have experienced in the delivery system. The survey includes 20 items, and should be sufficiently brief to use in many settings.

We are going to make a focus group qualitative analysis of investigators. The assessment is to be done by healthcare professionals before and after the implementation. The aim is to evaluate implementation success from the healthcare professional's perspective.

We will be monitoring and evaluating the utilization of health resources: hospitalizations, hospitalizations by ambulatory care sensitive conditions, re-admissions in a given short period of time, visits to GP, to the emergency room, to specialists.

The number and duration of hospitalizations, admissions to emergency room and avoidable hospitalizations in 12 months will be registered.

9. Chronogram

This implementation will be organized based on a 6-months run-in period, followed by a 12-months implementation period.

Run-in period/Searching for multimorbid patients – from September (2018) to February (2019) (M13-M19)

Selected patients observation – starts when first patient is included September/October (2018), end - February (2020). Each patient is observed for 1 year period (M13-M30)

During observation period selected patients will fill:

- PACIC quetionnaire – 1 time before the intervention and 1 time at the end of the phase.
- EQ-5D questionnaire – 1 time before the intervention and 1 time at the end of the phase.
- A focus group qualitative analysis of investigators will be performed twice during the investigation time.

These analyses will be done before the implementation and after the implementation.

Multidisciplinary team establishment M14-M19

- Assess multiprofessional team training needs
- Produce the guidelines for the multidisciplinary team.
- Establishment Multidisciplinary team
- Train the multiprofessional team to the use of the guidelines

Patient’s needs assessment M14-M19

- Collect information on patient’s needs
- Analyse the findings
- Modify the action plan according to findings

Case manager training M14-M19

- Assess the training need
- Consult with experts/WP partners and explore training alternatives
- Elaborate training program for case manager and other healthcare professionals, which should focus on the multimorbidity
- Train the case manager
- Establish links with social sector

Social sector and social worker active involvement M14-M30

- Involve social worker in the MM patient care
- Elaborate action plan
- Encourage patients to increase health literacy and tailor health promotion and prevention strategies

Individualized care plans M14-M19

- Regular comprehensive assessment is done using standardized assessment tools where possible, along with a clinical interview.
- Assess the complexity of conditions including treatment burden, drug interactions, and disease patterns etc.
- Identify key aspects which will be used in any consequent care planning steps,
- Review and update individualized care plan during the regular subsequent assessments

Patient self-management M20-M30

- Offer approaches to strengthen patients' self-management and self- efficacy,
- Include this point in the individualized care plane

Communication among healthcare professionals. M15-M30

- Asses the need of decision support
- Assign the personnel responsible for coordinating the team meetings
- Regular communication between Multidisciplinary team members

Guidelines on the management of multimorbidity M30-M33

Annex I: Survey to assess participating pilot sites

Contact information
Name:
Institute/unit:
Email:
Telephone:
General information
1. Please provide the full (official) name of the practice/programme
2. Please provide the full name of the leading organization of the practice/programme
3. In which country is the practice/programme implemented?
4. What are the main objectives of the practice/programme? *Please tick all boxes that apply*
☐ Promoting evidence-based practice
☐ Improving professional knowledge on multimorbidity
☐ Reducing inequalities in access to care and support services
☐ Improving accessibility of services
☐ Preventing or reducing over-use of services
☐ Preventing or reducing misuse of services
☐ Improving care coordination
☐ Improving integration of different units (within an organization)
☐ Improving integration of different organizations
☐ Increasing multi-disciplinary collaboration
☐ Identifying target group patients
☐ Improving early detection of additional/co-morbid diseases
☐ Improving patient involvement
☐ Improving involvement of informal carers (e.g. family, friends, neighbours and/ or volunteers)
☐ Improving functional status (preventing or reducing functional disability)
☐ Decreasing / delaying complications
☐ Decreasing morbidity
☐ Decreasing mortality
☐ Reducing hospital admissions
☐ Reducing emergency/acute care visits
☐ Reducing health care costs
☐ Improving patient safety
☐ Other (please specify)
5. Are there eligibility criteria for patients?
☐ No
☐ Yes
If yes, which ones? Please tick all boxes that apply
☐ Age

☐ Frailty status
☐ Comorbidity/multimorbidity status
☐ Cognitive status
☐ Disability
☐ Others (please specify)
6. Do you assess multimorbidity in each patient referred to the programme/practice?
☐ No
☐ Yes
If yes, how do you assess it? *Please tick all boxes that apply*
☐ Disease count
☐ Charlson comorbidity index
☐ CIRS scale
☐ Others (please specify)
7. Do you assess frailty in each patient referred to the programme/practice?
☐ No
☐ Yes
If yes, how do you assess it?
☐ Fried criteria (CHS criteria)
☐ Frailty index
☐ Others (please specify)
Delivery of care and Decision Support
1. Which care providers are involved in delivering care to patients admitted to the programme/practice? *Please tick all boxes that apply*
☐ General Practitioner/Primary care doctor/Family physician
☐ GP Nurse/Primary care nurse
☐ District/Community Nurse
☐ Case manager/specialist Nurse
☐ Cardiologist
☐ Pneumologist
☐ Endocrinologist
☐ Internist

☐ Haematologist
☐ Rheumatologist
☐ Nephrologist
☐ Gerontologist/Geriatrician/Elderly care specialist
☐ Ward/Out-patient Nurse
☐ Discharge Nurse (not general ward or out-patient nurse)
☐ Occupational Therapist
☐ Physiotherapist
☐ Dietician
☐ Speech Therapist
☐ Podiatrist
☐ Contact/call monitoring/eHealth Centre
☐ Pharmacist
☐ Social Worker
☐ Clinical psychologist/ medical psychologist
☐ Psychiatrist
☐ Ambulatory mental health worker
☐ Informal/Family/Friends/Carers unpaid
☐ Volunteers (who provide care from a volunteer organization)
☐ Others (please specify)
2. Do you currently use a case finding method or a tool/instrument for patient identification?
☐ No
☐ Yes
If yes, which one?
If no, please explain how patients are identified for integrated care services
3. From which care setting can a patient be identified to be included in integrated care services? *Please tick all boxes that apply*
☐ GP/Primary care
☐ Urgent care
☐ Out of hours care
☐ Social care

☐ Community/home care
☐ Acute Hospital care
☐ Sub-acute hospital care
☐ Community hospital care
☐ Others (please specify)
4. Which interventions/services can be offered to a patient? *Please tick all boxes that apply*
☐ Integrated frailty assessment (use of scales)
☐ Clinical (diagnostic/monitoring) tests (lab, ECG, etc)
☐ Therapeutic plan
☐ Medication review
☐ Patient education
☐ Self-care/self-management training/course
☐ Intravenous medication
☐ Hospitalisation
☐ Referral
☐ Coordination with social care organizations
☐ Follow up visits
☐ Routine monitoring
☐ E-services (i.e. e-visits)
☐ Referrals between medical specialties
☐ Coordination with social care
☐ Referral to community/home care nurse
☐ Others (please specify)
5. Is a care coordinator (care manager/ case manager)[95] appointed for patients in the practice/programme?
☐ No
☐ Yes
If yes, what qualifications does the care coordinator have?

[95][Infobox: Care Manager is the coordinator of care, linking the patient to providers, medical services, residential, social, behavioral, and other support services in the most effective way. Care manager also monitors continuity of care, follow-ups, and documentation.]

☐ Medical Doctor
☐ Nurse
☐ Social work
☐ Others (please specify)
6. Is a multidisciplinary team involved in the evaluation and care of the patient?
☐ No
☐ Yes
If yes, please specify if patients/representatives:
☐ Are informed about the development of their programme/practice/individualized care plan
☐ Are consulted (asked for their opinion) about the development of the programme
☐ Are asked for their advice in the development of the programme
☐ Work in partnership with professionals to develop the programme (co-producing)
☐ Have a final vote in decision-making regarding the development of the programme
If multi-disciplinary teams meet, meetings are:
☐ Face to face
☐ Virtual
How often do they meet?
7. Do these meetings involve patients and/or family?
☐ No
☐ Yes
8. Do these meetings involve GPs/primary care doctors/Family phisicians?
☐ No
☐ Yes
9. Which care professionals are the core members of the multidisciplinary team? *Please tick all boxes that apply*
☐ General Practitioner/Family physician/Primary care doctor
☐ GP Nurse/Primary care nurse

☐ Internist
☐ Gerontologist/Geriatrician
☐ Occupational Therapist
☐ Physiotherapist
☐ Dietician
☐ Speech Therapist
☐ Pharmacist
☐ Social Worker
☐ Others (please specify)
10. Is a consultation system available to consult professional experts outside the core team?
☐ No
☐ Yes
11. Are the care professionals trained specifically to work in a multidisciplinary team?
☐ No
☐ Yes
12. Do you use a comprehensive (geriatric) assessment tool to evaluate patients?
☐ No
☐ Yes
If yes, which one?
13. How often patients do undergo comprehensive assessment?
☐ Only at the start of the integrated care process
☐ At the start and at the end of the integrated care process
☐ At the start and periodically, every ……. months/weeks/ days
☐ Other (please specify)
14. Are individualized care plans developed for patients admitted to the practice/service?
☐ No
☐ Yes
Patient self-management
1. Does the practice/programme support self-management among patients and families?
☐ No

☐ Yes, patients/representatives:
☐ Are informed about the development of their programme/practice/individualized care plan
☐ Are consulted (asked for their opinion) about the development of the programme
☐ Are asked for their advice in the development of the programme
☐ Work in partnership with professionals to develop the programme (co-producing)
☐ Have a final vote in decision-making regarding the development of the programme
If yes, who is in charge of providing self-management support? *Please tick all boxes that apply*
☐ GP/ Primary care doctor/Family physician
☐ GP nurse /Primary care nurse
☐ Specialist
☐ Case manager/specialist nurse
☐ Other (please specify)
If yes, which options are offered to patients and families to improve self-management? *Please tick all boxes that apply*
☐ Motivational interviewing[96] to understand the needs of the patient
☐ Providing patients with information leaflets with treatment options
☐ Using a web based tool to prepare the patient for the consultation with the care provider
☐ Active participation in the decision making process concerning the choices in the care that is delivered
☐ Group-based courses
☐ Active participation in development of a personal /individualized care plan[97]
☐ Asking an informal carer to be present at the consultation with the care provider
☐ Other (please specify)
2. Are the professionals trained to provide self-management support to the patient?
☐ Yes

[96] [Infobox: Motivational Interviewing is a collaborative, goal-oriented method of communication with particular attention to the language of change. It is designed to strengthen an individual's motivation for and movement toward a specific goal by eliciting and exploring the person's own arguments for change.]

[97] [Infobox: A personal care plan is an agreement between the patient (or his/her informal carer) and the health care professional based on shared decision making, facilitating the treatment (or care) patients need and should receive. It covers areas including goals of the treatment, support services that patients need, medication and exercises. Other related terms are: individual care plan, personal health plan, integrated care plan, self-management plan, person centered plan.]

☐ No
E-health
1. Do you currently offer e-health services?
☐ No
☐ Yes
2. Are digital health care communication tools used within the practice/programme?
☐ No
☐ Yes
If yes, please specify. *Please tick all boxes that apply*
☐ E-referral system
☐ Exchange of information concerning common patients on treatment and care between different care providers (e.g. video conferences)
☐ Exchange of information on treatment and care between care provider and patient (e.g. video visits, e-visits)
☐ Online appointment scheduling
☐ Others (please specify)
3. Are electronic systems for registering/monitoring care processes used within the practice/programme?
☐ No
☐ Yes
If yes, please specify. Please tick all boxes that apply
☐ Tele-monitoring through video/telephone/sensors
☐ Registration by patients of health status parameters (e.g. body temperature, heart rate, blood pressure, respiratory rate) using remote sensor/mobile devices
☐ Monitoring of health status parameters by providers, using transmitted registration data
☐ Others (please specify)
4. Are electronic electronic decision support systems[98], used by care providers within the practice/programme?
☐ No

[98] [Infobox: decision support system: information, knowledge-based systems that support the decision-making process of care providers in a clinical environment (which help care providers in clinical practice)]

☐ Yes
If yes, please specify. *Please tick all boxes that apply*
☐ Computerized decision support tool aimed at:
☐ Medication treatment
☐ Non-medication treatment
☐ Non-medical treatment (e.g. social services)
☐ Electronic information/ warning aimed at patient safety
☐ Online (interactive) decision support
☐ Registration database consisting of patient data
☐ Electronic reminders emitted from a computer programme (e.g. appointment scheduling, available examination results)
5. Are systems that support self-management of patients, used by patients (or informal carers) within the programme?
☐ No
☐ Yes
If yes, please specify. *Please tick all boxes that apply*
☐ Electronic reminders for:
☐ Appointment/ consultation
☐ Medication intake
☐ Treatment adherence
☐ Monitoring health status parameters
☐ Computerized self-management tool concerning:
☐ Shared decision making
☐ Monitoring
☐ Behavioural change
☐ Other (please specify)
☐ Online (interactive) decision support
☐ Other (please specify)
6. Are Electronic Patient Records (EHRs) used within the practice/programme?
☐ Yes, EHRs are already in use

☐ We are planning to introduce EHRs
☐ No, EHRs are not used in the programme
If yes, who have access to the Electronic Patient Records (EHRs)?
☐ Only relevant medical care providers
☐ All relevant medical and non-medical care providers
☐ Patients
Community Resources
1. Does the programme support access/links to community and social resources?
☐ No
☐ Yes
If yes, please specify
☐ Formal social care
☐ Patient associations
☐ Peer support groups
☐ Resources providing psychosocial support (i.e. home help, transportation)
☐ Other (please specify)
Practice/Programme Assessment
1. Do you assess practice/programme related outcomes?
☐ No
☐ Yes
If yes, please specify:
☐ Quality of care (i.e. quality of care indicators, health care professional perception)
☐ Patient-related outcomes (i.e. falls, pain, polypharmacy, falls, quality of life measures)
☐ Care utilization/costs (i.e. hospitalization, health care costs)

Annex II: Assessment of participating pilot sites

CSJA. Implementation of a 'Personalized Action Plan' within the Strategy and the Comprehensive Plan for complex chronic patients

General information
1. *Name of the practice/programme:* • Implementation of a 'Personalized Action Plan' within the Strategy and the Comprehensive Plan for complex chronic patients
2. *Leading organization of the practice/programme:* • Regional Ministry of Health of Andalusia / Andalusian Health Service
3. *Country:* • Region Andalusia, Spain
4. *Main objectives of the practice/programme:* • Reducing inequalities in access to care and support services • Increasing multi-disciplinary collaboration • Improving patient involvement • Improving involvement of informal carers (e.g. family, friends, neighbours and/ or volunteers) • Improving functional status (preventing or reducing functional disability) • Decreasing / delaying complications • Reducing hospital admissions • Reducing emergency/acute care visits
5. *Eligibility criteria for patients:* • Frailty status • Comorbidity/multimorbidity status
6. *Multimorbidity assessment to patients referred to the programme/practice:* • Specific combination of diseases following the Comprehensive Healthcare Plan for Patients with Chronic Diseases
7. *Frailty assessment to patients referred to the programme/practice:* • Barthel, Lawton- Brody Scale and Integrated assessment
Delivery of care and Decision Support
1. *Care providers involved in delivering care to patients admitted to the programme/practice:* • General Practitioner/Primary care doctor/Family physician • GP Nurse/Primary care nurse • Case manager/specialist Nurse • Internist • Contact/call monitoring/eHealth Centre • Social Worker • Informal/Family/Friends/Unpaid Carers
2. *Case finding method /tool/instrument used for patient identification:* • Patients master index available in all facilities of the Andalusian Health Service
3. *Setting from which a patient can be identified to be included in integrated care services:* • GP/Primary care
4. *Interventions/services offered the patients:* • Integrated frailty assessment (use of scales) • Clinical (diagnostic/monitoring) tests (lab, ECG, etc) • Therapeutic plan • Medication review

• Patient education • Selfcare/ self-management training/course • Follow-up visits • Routine monitoring • E-services (i.e. e-visits) • Referrals between medical specialties • Referral to community/home care nurse
5. *Patients' care coordinator/s (care manager/ case manager)*[99] *:* • Medical Doctor
6. *Type of meetings of the multidisciplinary teams involved in the patient evaluation and care:* • Face to face • Virtual *Meetins frecuency:* • When needed (aprox once a week)
7. *Involvement of patients and/or family in these meetings:* • No, they are not involved
8. *Involvement of GPs/primary care doctors/Family physicians in these meetings:* • Yes
9. *Core members of the multidisciplinary team:* • General Practitioner/Family physician/Primary care doctor • GP Nurse/Primary care nurse • Internist • Case management nurse • Internist sometimes
10. *Availability of a system to consult professional experts outside the core team:* • Yes
11. *Professionals are trained specifically to work in a multidisciplinary team:* • Yes
12. *Use of a comprehensive (geriatric) assessment tool to evaluate patients:* • No
13. *Individualized care plans developed for patients admitted to the practice/service:* • Yes
Patient self-management

[99][Infobox: Care Manager is the coordinator of care, linking the patient to providers, medical services, residential, social, behavioral, and other support services in the most effective way. Care manager also monitors continuity of care, follow-ups, and documentation.]

1. *he practice/programme supports self-management among patients and families:*
   Patients/representatives:
   - Are informed about the development of their programme/practice/individualized care plan
   - Are consulted (asked for their opinion) about the development of the programme
   - Work in partnership with professionals to develop the programme (co-producing)
   - Have a final vote in decision-making regarding the development of the programme

   Professionals in charge of providing self-management support:
   - GP/Primary care doctor/Family physician
   - GP nurse/Primary care nurse

   Options offered to patients and families to improve self-management:
   - Providing patients with information leaflets with treatment options
   - Active participation in the decision-making process concerning the choices in the care that is delivered
   - Active participation in development of a personal /individualized care plan

2. *Professionals are trained to provide self-management support to the patient:*
   - Yes

E-health

1. *Offer of e-health services:*
   - Yes

2. *Digital health care communication tools within the practice/programme:*
   - E-referral system
   - Exchange of information concerning common patients on treatment and care between different care providers
   - (e.g. video conferences)
   - Exchange of information on treatment and care between care provider and patient (e.g. video visits, e-visits)
   - Online appointment scheduling
   - Lab tests, image services available too

3. *Electronic systems for registering/monitoring care processes used within the practice/programme:*
   - Registration by patients of health status parameters (e.g. body temperature, heart rate, blood pressure, respiratory rate) using remote sensor/mobile devices

4. *Electronic decision support systems[100], used by care providers within the practice/programme:*
   - No

5. *Systems to support self-management of patients, used by patients :*
   - Electronic reminders for:
     - Appointment/ consultation
     - Treatment adherence
   - Communication with healthcare professionals

6. *Electronic Patient Records (EHRs) used within the practice/programme:*
   - Yes. All relevant medical and non-medical care providers have access to the EHRs

Community Resources

[100] [Infobox: decision support system: information, knowledge-based systems that support the decision-making process of care providers in a clinical environment (which help care providers in clinical practice)]

1. *The programme supports access/links to community and social resources:* • No
Practice/Programme Assessment
1. *Assessment of practice/programme related outcomes:* • Quality of care (i.e. quality of care indicators, health care professional perception). • Patient-related outcomes (i.e. falls, pain, polypharmacy, falls, quality of life measures). • Care utilization/costs (i.e. hospitalization, health care costs).

IACS. Aragon Primary Care

General information
1. *Name of the practice/programme:* • Aragon Primary Care
2. *Leading organization of the practice/programme:* • Departamento de Sanidad
3. *Country:* • Region Aragón, Spain
4. *Main objectives of the practice/programme:* • Promoting evidence-based practice • Reducing inequalities in access to care and support services • Preventing or reducing misuse of services • Increasing multi-disciplinary collaboration • Decreasing morbidity
5. *Eligibility criteria for patients:* • No
6. *Multimorbidity assessment to patients referred to the programme/practice:* • No
7. *Frailty assessment to patients referred to the programme/practice:* • No
Delivery of care and Decision Support
1. *Care providers involved in delivering care to patients admitted to the programme/practice:* • General Practitioner/Primary care doctor/Family physician • GP Nurse/Primary care nurse • Physiotherapist • Social Worker
2. *Case finding method /tool/instrument used for patient identification:* • No
3. *Setting from which a patient can be identified to be included in integrated care services:* • GP/Primary care
4. *Interventions/services offered the patients:* • Clinical (diagnostic/monitoring) tests (lab, ECG, etc) • Patient education • Referral • Follow-up • Visits • Referrals between medical specialties • Coordination with social care

5. *Patients' care coordinator/s (care manager/ case manager) :* • Medical Doctor
6. *Type of meetings of the multidisciplinary teams involved in the patient evaluation and care:* • *Face to face* *Meetings frecuency:* • Rarely
7. *Involvement of patients and/or family in these meetings:* • No
8. *Involvement of GPs/primary care doctors/Family physicians in these meetings:* • Yes
9. *Core members of the multidisciplinary team:* • General Practitioner/Family physician/Primary care doctor • GP Nurse/Primary care nurse • Social Worker
10. *Availability of a system to consult professional experts outside the core team:* • Yes
11. *Professionals are trained specifically to work in a multidisciplinary team:* • No
12. *Use of a comprehensive (geriatric) assessment tool to evaluate patients:* • No
13. *Individualized care plans developed for patients admitted to the practice/service:* • No
Patient self-management
1. *The practice/programme supports self-management among patients and families:* • *No*
E-health
1. *Offer of e-health services:* • No
2. *Digital health care communication tools within the practice/programme:* • Monitoring of health status parameters by providers, using transmitted registration data
3. *Electronic systems for registering/monitoring care processes used within the practice/programme:* • No
4. *Electronic decision support systems , used by care providers within the practice/programme:* • No
5. *Systems to support self-management of patients, used by patients :* • No
6. *Electronic Patient Records (EHRs) used within the practice/programme:* • Yes. • Only relevant medical care providers to the EHRs
Community Resources
1. *The programme supports access/links to community and social resources:* • No
Practice/Programme Assessment
1. *Assessment of practice/programme related outcomes:* • Care utilization/costs (i.e. hospitalization, health care costs). o Healthcare costs, hospitalizations

UCSC. Multimorbidity Care Model in elders with dementia and adults with intellectual disability

General information
1. *Name of the practice/programme:* • Multimorbidity Care Model in elders with dementia and adults with intellectual disability
2. *Leading organization of the practice/programme:* • Department of Geriatrics, Università Cattolica del Sacro Cuore, Rome, Italy
3. *Country:* • Rome (Italy)
4. *Main objectives of the practice/programme:* • Improving professional knowledge on multimorbidity • Reducing inequalities in access to care and support services • Improving accessibility of services • Improving care coordination • Improving integration of different units (within an organization) • Increasing multi-disciplinary collaboration • Identifying target group patients • Improving patient involvement • Improving involvement of informal carers (e.g. family, friends, neighbours and/ or volunteers) • Reducing hospital admissions • Reducing emergency/acute care visits
5. *Eligibility criteria for patients:* • Age • Frailty status • Comorbidity/multimorbidity status • Cognitive status • Disability
6. *Multimorbidity assessment to patients referred to the programme/practice:* • *Yes*
7. *Frailty assessment to patients referred to the programme/practice:* • *Patients are assessed*
Delivery of care and Decision Support
1. *Care providers involved in delivering care to patients admitted to the programme/practice:* • Case manager/specialist Nurse • Cardiologist • Pneumologist • Endocrinologist • Internist • Haematologist • Nephrologist • Gerontologist/Geriatrician/Elderly care specialist • Occupational Therapist • Physiotherapist • Contact/call monitoring/eHealth Centre • Ambulatory mental health worker
2. *Case finding method /tool/instrument used for patient identification:* • Yes
3. *Setting from which a patient can be identified to be included in integrated care services:* • Acute Hospital care

4. *Interventions/services offered the patients:* • Integrated frailty assessment (use of scales) • Therapeutic plan • Patient education • Coordination with social care organizations • Follow-up • visits • E-services (i.e. e-visits) • Referrals between medical specialties
5. *Patients' care coordinator/s (care manager/ case manager) :* • Medical Doctor
6. *Type of meetings of the multidisciplinary teams involved in the patient evaluation and care:* • Face to face • Virtual *Meetins frecuency:* • Once a week
7. *Involvement of patients and/or family in these meetings:* • No
8. *Involvement of GPs/primary care doctors/Family physicians in these meetings:* • No
9. *Core members of the multidisciplinary team:* • Internist • Gerontologist/Geriatrician • Others
10. *Availability of a system to consult professional experts outside the core team:* • Yes
11. *Professionals are trained specifically to work in a multidisciplinary team:* • Yes
12. *Use of a comprehensive (geriatric) assessment tool to evaluate patients:* • Yes *Patients undergo comprehensive assessment at the start and at the end of the integrated care process*
13. *Individualized care plans developed for patients admitted to the practice/service:* • Yes
Patient self-management
1. *The practice/programme supports self-management among patients and families:* *Patients/representatives:* • Are informed about the development of their programme/practice/individualized care plan *Professionals in charge of providing self-management support:* • Specialist • Case manager/specialist nurse *Options offered to patients and families to improve self-management:* • Motivational interviewing* to understand the needs of the patient • Active participation in development of a personal /individualized care plan
2. *Professionals are trained to provide self-management support to the patient:* • Yes
E-health
5. *Offer of e-health services:* • Yes

6. *Digital health care communication tools within the practice/programme:* • Exchange of information on treatment and care between care provider and patient (e.g. video visits, e-visits)
7. *Electronic systems for registering/monitoring care processes used within the practice/programme:* • Patient associations
Community Resources
1. *The programme supports access/links to community and social resources:* • Patient associations
Practice/Programme Assessment
1. *Assessment of practice/programme related outcomes:* • Quality of care (i.e. quality of care indicators, health care professional perception). • Patient-related outcomes (i.e. falls, pain, polypharmacy, falls, quality of life measures).

Kauno Klinicos

General information
1. *Name of the practice/programme:* • Kauno klinikos
2. *Leading organization of the practice/programme:* • Kauno klinikos
3. *Country:* • Lithuania
4. *Main objectives of the practice/programme:* • Promoting evidence-based practice • Improving accessibility of services • Preventing or reducing over-use of services • Preventing or reducing misuse of services • Improving care coordination • Improving integration of different units (within an organization) • Improving integration of different organizations • Increasing multi-disciplinary collaboration • Identifying target group patients • Improving patient involvement • Reducing health care costs
5. *Eligibility criteria for patients:* • Age • Comorbidity/multimorbidity status
6. *Multimorbidity assessment to patients referred to the programme/practice:* • Disease count
7. *Frailty assessment to patients referred to the programme/practice:* • No assessment in place
Delivery of care and Decision Support
1. *Care providers involved in delivering care to patients admitted to the programme/practice:* • General Practitioner/Primary care doctor/Family physician • GP Nurse/Primary care nurse • Case manager/specialist Nurse • Cardiologist • Pneumologist

• Endocrinologist • Others • *Social worker, psychiatrist will be involved upon the needs*
2. *Case finding method /tool/instrument used for patient identification:* • No, we will use hospital statistical data (patients who are listed in KAUNO KLINIKOS family department
3. *Setting from which a patient can be identified to be included in integrated care services:* • GP/Primary care
4. *Interventions/services offered the patients:* • Integrated frailty assessment (use of scales) • Clinical (diagnostic/monitoring) tests (lab, ECG, etc) • Therapeutic plan • Medication review • Patient education • Self-care • / self-management training/course • Referral • Follow-up • visits • Routine monitoring • E-services (i.e. e-visits) • Referrals between medical specialties • Coordination with social care
5. *Patients' care coordinator/s (care manager/ case manager) :* • Nurse
6. *Type of meetings of the multidisciplinary teams involved in the patient evaluation and care:* • Virtual *Meetings frecuency:* • Every three months
7. *Involvement of patients and/or family in these meetings:* • No, they are not involved
8. *Involvement of GPs/primary care doctors/Family physicians in these meetings:* • Yes
9. *Core members of the multidisciplinary team:* • General Practitioner/Family physician/Primary care doctor • GP Nurse/Primary care nurse • Specialists: pulmunologist, cardiologist and endocrinologits
10. *Availability of a system to consult professional experts outside the core team:* • No availability
11. *Professionals are trained specifically to work in a multidisciplinary team:* • No
12. *Use of a comprehensive (geriatric) assessment tool to evaluate patients:* • No
13. *Individualized care plans developed for patients admitted to the practice/service:* • Yes
Patient self-management
1. *The practice/programme supports self-management among patients and families:* *Patients/representatives:*

• Are informed about the development of their programme/practice/individualized care plan *Professionals in charge of providing self-management support:* • GP/Primary care doctor/Family physician • GP nurse/Primary care nurse *Options offered to patients and families to improve self-management:* • Motivational interviewing to understand the needs of the patient • Providing patients with information leaflets with treatment options • Active participation in development of a personal /individualized care plan
2. *Professionals are trained to provide self-management support to the patient:* • No
E-health
1. *Offer of e-health services:* • Yes
2. *Digital health care communication tools within the practice/programme:* • E-referral system • Exchange of information concerning common patients on treatment and care between different care providers • (e.g. video conferences) • Online appointment scheduling
3. *Electronic systems for registering/monitoring care processes used within the practice/programme:* • Tele-monitoring through video/telephone/sensors • Registration by patients of health status parameters (e.g. body temperature, heart rate, blood pressure, • respiratory rate) using remote sensor/mobile devices • Monitoring of health status parameters by providers, using transmitted registration data
4. *Electronic decision support systems , used by care providers within the practice/programme:* • No
5. *Systems to support self-management of patients, used by patients :* • No
6. *Electronic Patient Records (EHRs) used within the practice/programme:* • Yes. Only relevant medical care providers have access to the EHRs
Community Resources
1. *The programme supports access/links to community and social resources:* • No
Practice/Programme Assessment
1. *Assessment of practice/programme related outcomes:* • Quality of care (i.e. quality of care indicators, health care professional perception). • Patient-related outcomes (i.e. falls, pain, polypharmacy, falls, quality of life measures). • Care utilization/costs (i.e. hospitalization, health care costs). • Assessment tool for quality of care evaluation • Assessment tool for quality of life • Poly pharmacy measurement • Holistic evaluation of patient: psycho social evaluation

VULSK. Family Medicine Center, Primary care

General information
1. *Name of the practice/programme:* • Family Medicine Center, Primary care
2. *Leading organization of the practice/programme:* • Vilnius University Hospital Santaros Klinikos
3. *Country:* • Vilnius (Lithuania)
4. *Main objectives of the practice/programme:* • Promoting evidence-based practice
5. *Eligibility criteria for patients:* • No
6. *Multimorbidity assessment to patients referred to the programme/practice:* • No
7. *Multimorbidity assessment to patients referred to the programme/practice:* • No
Delivery of care and Decision Support
1. *Care providers involved in delivering care to patients admitted to the programme/practice:* • General Practitioner/Primary care doctor/Family physician • GP Nurse/Primary care nurse
2. *Case finding method /tool/instrument used for patient identification:* • Patients are identified for integrated care services through GP criteria
3. *Setting from which a patient can be identified to be included in integrated care services:* • GP/Primary care
4. *Interventions/services offered the patients:* • Clinical (diagnostic/monitoring) tests (lab, ECG, etc) • Patient education • Follow-up • visits • Referrals between medical specialties • Coordination with social care
5. *Patients' care coordinator/s (care manager/ case manager) :* • No
6. *Type of meetings of the multidisciplinary teams involved in the patient evaluation and care:* • *No, there is multidisciplinary team involved in patient evaluation and care*
Patient self-management
3. *The practice/programme supports self-management among patients and families:* • No
E-health
1. *Offer of e-health services:* • Yes
2. *Digital health care communication tools within the practice/programme:* • E-referral system
3. *Electronic systems for registering/monitoring care processes used within the practice/programme:* • No
4. *Electronic decision support systems , used by care providers within the practice/programme:* • No
5. *Systems to support self-management of patients, used by patients :*

• No
6. *Electronic Patient Records (EHRs) used within the practice/programme:* • Yes, Only relevant medical care providers have access to the EHRs
Community Resources
1. *The programme supports access/links to community and social resources:* • No
Practice/Programme Assessment
1. *Assessment of practice/programme related outcomes:* • No

Annex III. Tasks to be covered in each LIGW meeting

1st meeting: SCOPE

- Get to know each other
- Explain objectives of the session
- Introduce the JA CHRODIS PLUS
- Identify appropriate stakeholders
- Present the pre-implementation phase
- Topic selection
- Perform the scope definition as described below

Material needed:

- Brief presentation on the JA CHRODIS PLUS
- Presentation on the pre-implementation phase
- Guidelines on scope definition
- Template to collect data on scope definition
- PC and projector
- White boards
- Markers

2nd meeting: SWOT

- Explain objectives of the session
- Explain the background and aims of the SWOT analysis
- Perform SWOT analysis following the methodology described in the guidelines
- Review and adapt scope definition, if needed

Material needed:

- Presentation on the basis of the SWOT analysis
- Guidelines on SWOT analysis
- Template to collect data on SWOT analysis
- PC and projector
- White boards
- Markers

Optional meeting: Scirocco Maturity Model

- Explain objectives of the session
- Present the Maturity Model
- Individual self-assessment by each member
- Negotiation and consensus building

Material needed:

- Presentation on the Maturity Model
- Guideline to run the workshop

- Dimension narratives, prompts and scales
- Template to collect reasoning behind each score and radar diagram template
- PC and projector
- Whiteboard for the consensus building
- Markers

3rd meeting: Action plan, collaborative methodology I

- Explain objectives of the session
- Review briefly the information gathered in the previous activities
- Select the specific topic to work on
- Identify the improvement areas
- Define feasible objectives aligned with the improvement areas
- Review and adapt scope definition, if needed

Material needed:

- Brief presentation on the whole Collaborative methodology
- Guidelines to run the workshop
- Templates to collect participants´ feedback
- PC and projector
- Whiteboard
- Markers

4th meeting: Action plan, collaborative methodology II

- Explain objectives of the session
- Review briefly the improvement areas and the objectives defined in the previous session
- Define the actions to be implemented with the “change package”
- Specify the key performance indicators to assess the impact of the actions
- Review and adapt scope definition, if needed

Material needed:

- Brief presentation on the Collaborative methodology
- Presentation showing the alignment of the improving areas and the objectives agreed during the previous working session
- Guidelines to run the workshop
- Templates to collect participants´ feedback
- PC and projector
- Whiteboard
- Markers

Annex IV. Template for the scope definition and topic identification

Item	Description
Problem/challenge	
General purpose of the intervention	
Target population	
Topic identification: central features/elements	

Annex V. Steps and template to conduct SWOT analysis

The steps to conduct a SWOT analysis are:

1. Introduction and objectives (~30 min). The organizer of the LIWG illustrates the aim of the SWOT analysis, explaining how each participant (as key stakeholder), can contribute to the session and how the emerging data will be used to improve local practices.
2. SWOT analysis in small groups (~60 min) - The organizer illustrates the methodology. Each group will identify a facilitator that will ease the discussion and the SWOT analysis. Anyone can be the facilitator but, to support effective communication, the ideal is to involve participants with specific communication skills or experience. During the discussion, all participants will express their opinion according to the SWOT frame and dimensions. There are no good or bad opinions, all ideas are taken into consideration. The ideas are discussed within the group and can be written on a flipchart or post it, that can be easily placed and replaced on the flipchart following the group discussion. The facilitator encourages the active participation of all participants and reports on the flipchart the emerging ideas. Once the internal (S&W) and external (O&T) attributes and conditions of the topic have been described in depth, priorities and strategic actions can be identified. The discussion is focused on how leverage on S&O in order to address W&T, as well as a cross analysis of internal and external factors with the micro and macro environments of the practice. The group will then set recommendations, lines and priority of actions that can support the implementation process.
1. Plenary session (~60 min). At the end of the group work, in plenary session, each group will present its SWOT analysis to the rest of the participants. If discordant aspects emerge, they will be discussed until an agreement is reached.
2. Next steps. The final output of the SWOT session will be a set of flipcharts that represents a shared situation analysis made by all the relevant stakeholders according to the SWOT frame and dimensions. In the next few days, the organizer will integrate the contents of the different groups in a short report. The report may include the narrative as well as the images of the SWOT produced by the groups.

The material necessary for the organization of the local SWOT Analysis Workshop are: computer, video projector, flipchart and coloured markers, Post it, handouts.

The proposed template for SWOT analysis is:

Strengths	Weaknesses
• •	• •
Opportunities	**Threats**
• •	• •

Annex VI. SCIROCCO Maturity Model

The Scirocco Maturity Model aims to facilitate the implementation of integrated care by recognizing the maturity requirements of health and care systems or organizations. It considers the environment in which an intervention has developed, or into which will be implemented. The main goal of the model is to provide a multi-dimensional benchmark of the maturity of a context.

The model has been derived from interviews that took place in 12 regions[101] within European countries responsible for health and care delivery that are part of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA)[102]. The many activities that need to be managed in order to deliver integrated care were grouped into 12 'dimensions':

1. Readiness to change
2. Structure and governance
3. Information and eHealth services
4. Standardization and simplification
5. Finance and funding
6. Removal of inhibitors
7. Population approach
8. Citizen empowerment
9. Evaluation methods
10. Breadth of ambition
11. Innovation management
12. Capacity building

The interventions are designed and deployed by local implementation team. As such, it is needed a diversity of perspectives in making the assessment.

Methodology

The process of the self-assessment to be used by local implementation groups will be held during a one-day workshop. Each group member should familiarize with the model before attending the workshop to start thinking on the scores of each dimension beforehand.

One moderator and one person to take the notes will be needed in the meeting.

The activities to be performed during the workshop are:

1. *Introduction of the Scirocco Maturity Model*

[101] Attica (Greece), Basque Country (Spain), Catalonia (Spain),, Delta (Netherlands), Olomouc region (Czech republic), Galicia (Spain), Northern Ireland (UK), Puglia (Italy), Saxony (Germany), Scotland (UK), Skane (Sweden), South Denmark (Denmark).
[102] https://ec.europa.eu/eip/ageing/home_en

The moderator will introduce the model and each dimension. The group members will share their understanding and doubts, so they agree on the same approach.

Each dimension contains:

- A narrative description that overviews the dimension
- A set of "prompts" designed to prompt discussion
- An assessment scale

2. Self-assessment by each group member

Each member of the team constructs his/her responses to the questionnaire independently in paper, based on its knowledge and experience.

Assessing the dimension involves reading the narrative and deciding on a level in the assessment scale. To justify the decision on the assessment scale it is necessary to describe "why you think this is the right level". This may involve mentioning some of the features of the system that came up when considering the prompts. Team members can start with an "easy" dimension, but it is preferably not to leave the all the difficult ones to the end.

Team members provide their assessment scores and justifications to the moderator, so he/she can organize the following activity.

3. Reaching consensus

This task aims to support reaching consensus in a structured way. First, the moderator of the workshop will introduce each dimension, followed by the scores and the justifications of each team member. All participants can share their perceptions and views to enrich the discussion.

The group will reach consensus on each dimension before going to the next one. The dimensions can be considered in any order; there is no need to do in any prescribed order, but it is recommended to start with the dimensions with the biggest differences in scoring.

4. Commonly agreed spider diagram and justifications

The moderator will read the agreed scores and the justifications of the dimensions to ensure the information recorded in the final document is correct.

Below an example of the agenda for the workshop:

Time	Session Title
30 minutes	**Welcome, meeting´s objectives and methodology**
60 minutes	**Self-assessment by each group member** Presentation of the individual spider diagram results. Scores and justifications.
90 minutes	**Negotiation and Consensus Building.** Agreement on the final diagram. Consensus on the final scoring per each dimension, including the rationale for scoring. • Facilitated discussion on the outcomes of the self-assessment process. • Moderator will introduce the outcomes per each dimension and seek the consensus from the partners on the final scoring per particular dimension, including the rationale for scoring. • The reporter will record all the final scoring and the justifications.
15 minutes	**Conclusions** The facilitator will summarize the day.

Dimensions

1. Readiness to Change

Objectives:

If the existing systems of care need to be re-designed to provide a more integrated set of services, this will require change across many levels, the creation of new roles, processes and working practices, and new systems to support information sharing and collaboration across care teams. This will be disruptive and may be viewed negatively by workers, press and public, so a clear case needs to be made for those changes, including a justification, a strategic plan, and a vision of better care.

- Creating a compelling vision, with a real sense of urgency, and enlisting stakeholder support including political leadership, management, care professionals, public and press.
- Accepting the reality that care systems are unsustainable and need to change.
- Publishing a clear description of the issues, the choices that need to be made, and the desired future state of the care systems, stating what will be the future experience of care.
- Creating a sense of urgency to ensure sustained focus, and building a 'guiding coalition' for change.

Assessment scale:

0 – No acknowledgement of compelling need to change
1 – Compelling need is recognised, but no clear vision or strategic plan
2 – Dialogue and consensus-building underway; plan being developed
3 – Vision or plan embedded in policy; leaders and champions emerging
4 – Leadership, vision and plan clear to the general public; pressure for change
5 – Political consensus; public support; visible stakeholder engagement.

2. Structure & Governance

Objectives:

The broad set of changes needed to deliver integrated care at a regional or national level presents a significant challenge. It needs multi-year programmes with excellent change management, funding and

communications, and the power to influence and (sometimes) mandate new working practices. This means alignment of purpose across diverse organisations and professions, and the willingness to collaborate and put the interest of the overall care system above individual incentives. It also means managing the introduction of eHealth services to enable integrated care in a way that makes them easy to use, reliable, secure, and acceptable to care professionals and citizens alike.

- Enabling properly funded programmes, including a strong programme, project management and change management; establishing ICT or eHealth competence centres to support roll-out; distributed leadership, to reduce dependency on a single heroic leader; excellent communication of goals, progress and successes.
- Managing successful eHealth innovation within a properly funded, multi-year transformation programme.
- Establishing organisations with the mandate to select, develop and deliver eHealth services.

Assessment scale:

0 – Fragmented structure and governance in place
1 – Recognition of the need for structural and governance change
2 – Formation of task forces, alliances and other informal ways of collaborating
3 – Governance established at a regional or national level
4 – Roadmap for a change programme defined and broadly accepted
5 – Full, integrated programme established, with funding and a clear mandate.

3. ICT & eHealth Services

Objectives:

Integrated care requires, as a foundational capability, sharing of health information and care plans across diverse care teams that lead progressively to systems for enabling continuous collaboration, measuring and managing outcomes, and enabling citizens to take a more active role in their care. This means building on existing eHealth services, connecting them in new ways to support integration, and augmenting them with new capabilities, such as enhanced security and mobility.

- Essential components to enable information-sharing, based on secure and trusted services.
- 'Digital first' policy (where possible, move phone and face-to-face services to digital services to reduce dependence on staff and promote self-service).
- Availability of fundamental building blocks to enable eHealth and eServices ('infostructure').
- Confidentiality and security designed into patient records, registries, online services etc.
- Enabling of new channels for healthcare delivery to replace face-to-face and telephone contact.

Assessment scale:

0 – ICT systems are not designed to support integrated care
1 – ICT and eHealth services to support integrated care are being piloted
2 – ICT and eHealth services to support integrated care are deployed but there is not yet region wide coverage
3 – ICT and eHealth services to support integrated care are planned and deployed widely at large scale but use of these services is not mandated
4 – Mandated or funded use of regional/national eHealth infrastructure across the healthcare system
5 – Universal, at-scale regional/national eHealth services used by all integrated care stakeholders.

4. Standardisation & Simplification

Objectives:

When considering eHealth services and how they can support the information sharing and collaboration needs of integrated care, the task can be made easier if the number of different systems in use, and the formats in which they store data, can be simplified. Practically, this means trying to consolidate data

centres, standardising on fewer systems, and agreeing on what informatics standards will be used across a region or country.

- Simplification of infrastructure; fewer integration points to manage; easier interoperability.
- Consolidation of applications and data centres into fewer sites.
- Regional standardisation on fewer (or single) solutions.
- Ability to view and exchange medical data from different systems across diverse care settings.

Assessment scale:

0 – No standards in place or planned that support integrated care services
1 – Discussion of the necessity of ICT to support integrated care and of any standards associated with that ICT
2 – An ICT infrastructure to support integrated care has been agreed together with a recommended set of information standards – there may still be local variations
3 – A recommended set of agreed information standards at regional/national level; some shared procurements of new systems at regional/national level; some large-scale consolidations of ICT underway
4 – A unified set of agreed standards to be used for system implementations specified in procurement documents; many shared procurements of new systems; consolidated data centres and shared services widely deployed
5 – A unified and mandated set of agreed standards to be used for system implementations fully incorporated into procurement processes; clear strategy for regional/national procurement of new systems; consolidated datacentres and shared services (including the cloud) is normal practice.

5. Funding

Objectives:

Changing systems of care so that they can offer better integration requires initial investment and funding; a degree of operational funding during transition to the new models of care; and on-going financial support until the new services are fully operational and the older ones are de-commissioned. Ensuring that initial and on-going costs can be financed is an essential activity that uses the full range of mechanisms from regional/national budgets to 'stimulus' funds, European Union investment funds, public-private partnerships (PPP) and risk-sharing mechanisms).

Assessment scale:

0 – No additional funding is available to support the move towards integrated care
1 – Funding is available but mainly for the pilot projects and testing
2 – Consolidated innovation funding available through competitions/grants for individual care providers and small-scale implementation
3 – Regional/national (or European) funding or PPP for scaling-up is available
4 – Regional/national funding for on-going operations is available
5 – Secure multi-year budget, accessible to all stakeholders, to enable further service development.

6. Removal of Inhibitors

Objectives:

Even with political support, funded programmes and good eHealth infrastructure, many factors can still make integrated care difficult to deliver, by delaying change or limiting how far change can go. These include legal issues with data governance, resistance to change from individuals or professional bodies, cultural barriers to the use of technology, perverse financial incentives, and lack of skills. These factors need to be recognised early, and a plan developed to deal with them, so as to minimise their impact.

- Actions to remove barriers: legal, organisational, financial, skills.
- Changes to the law concerning e.g., medical acts, information governance, data sharing –factors which may hold up innovation.

- Creation of new organisations or collaborations to encourage cross-boundary working ('normative integration').
- Changes to reimbursement to support behavioural change and process change.
- Education and training to increase understanding of ICT and speed up solution delivery.

Assessment scale:

0 – No awareness of the effects of inhibitors on integrated care
1 – Awareness of inhibitors but no systematic approach to their management is in place
2 – Strategy for removing inhibitors agreed at a high level
3 – Implementation Plan and process for removing inhibitors have started being implemented locally
4 – Solutions for removal of inhibitors developed and commonly used
5 – High completion rate of projects & programmes; inhibitors no longer an issue for service development

7. Population Approach

Objectives:

Integrated care can be developed to benefit those citizens who are not thriving under existing systems of care, in order to help them manage their health and care needs in a better way, and to avoid emergency calls and hospital admissions and reduce hospital stays. This is a practical response to meeting today's demands. Population health goes beyond this, and uses methods to understand where future health risk (and so, demand) will come from. It offers ways to act ahead of time, to predict and anticipate, so that citizens can maintain their health for longer and be less dependent on care services as they age.

- Understanding and anticipating demand; meeting needs better.
- Improving the resilience of care systems by using existing data on public health, health risks, and service utilisation.
- Taking steps to divert citizens into more appropriate and convenient care pathways based on user preferences.
- Predicting future demand and taking steps to reduce health risks though technology-enabled public health interventions.

Assessment scale:

0 – Population health approach is not applied to the provision of integrated care services
1 – A population risk approach is applied to integrated care services but not yet systematically or to the full population
2 – Risk stratification is used systematically for certain parts of the population (e.g. high-use categories)
3 – Group risk stratification for those who are at risk of becoming frequent service users
4 –Population-wide risk stratification started but not fully acted on
5 – Whole population stratification deployed and fully implemented.

8. Citizen Empowerment

Objectives:

Health and social care systems are under increasing pressure to respond to demands that could otherwise be handled by citizens and carers themselves. The evidence suggests that many individuals would be willing to do more to participate in their own care if easy-to-use services, such as appointment booking, self-monitoring of health status, and alternatives to medical appointments, were available to them. This means providing services and tools that enable convenience, offer choice, and encourage self-service and engagement in health management.

Assessment scale:

0 – Citizen Empowerment is not considered as part of integrated care provision
1 – Citizen empowerment is recognised as important part of integrated care provision but effective policies to support citizen empowerment are still in development

2 - Citizen empowerment is recognised as important part of integrated care provision, effective policies to support citizen empowerment are in place but citizens do not have access to health information and health data
3 - Citizens are consulted on integrated care services and have access to health information and health data
4 – Incentives and tools exist to motivate and support citizens to co-create healthcare services and use these services to participate in decision-making process about their own health
5 – Citizens are fully engaged in decision-making processes about their health, and are included in decision-making on service delivery and policy-making.

9. Evaluation Methods

Objectives:

As new care pathways and services are introduced to support integrated care, there is a clear need to ensure that the changes are having the desired effect on quality of care, cost of care, access and citizen experience. This supports the concept of evidence-based investment, where the impact of each change is evaluated, ideally by health economists working in universities or in special agencies. Health technology assessment (HTA) is an important method here, and can be used to justify the cost of scaling up good practices to regional or national level.

- Establishing baselines (on cost, quality, access etc.) in advance of new service introduction.
- Systematically measuring the impact of new services and pathways using appropriate methods (e.g., observational studies, incremental improvement, clinical trials).
- Generating evidence that leads to faster adoption of good practice.

Assessment scale:

0 – No evaluation of integrated care services is in place or in development
1 – Evaluation of integrated care services exists, but not as a part of a systematic approach
2 – Evaluation of integrated care services is planned to take place and be established as part of a systematic approach
3 – Some integrated care initiatives and services are evaluated as part of a systematic approach
4 – Most integrated care initiatives are subject to a systematic approach to evaluation; published results
5 – A systematic approach to evaluation, responsiveness to the evaluation outcomes, and evaluation of the desired impact on service redesign (i.e., a closed loop process).

10. Breadth of Ambition

Objectives:

Integrated care includes many levels of integration, such as integration between primary and secondary care, of all stakeholders involved in the care process, or across many organisations. It may be developed simply for healthcare needs (i.e., vertical integration) or it may include social workers, the voluntary sector, and informal care (i.e., horizontal integration). The broader the ambition, the more numerous and diverse the stakeholders who have to be engaged. Similarly, integration may include all levels of the system or may be limited to clinical information sharing. The long-term goal should be fully integrated care services which provide a complete set of seamless interactions for the citizen, leading to better care and improved outcomes.

- Integration supported at all levels within the healthcare system – at the macro (policy, structure), meso (organisational, professional) and micro (clinical) levels.
- Integration between the healthcare system and other care services (including social, voluntary, informal, family services).
- Seamless transition for the patient between and within care services.

Assessment scale:

0 – Integrated services arise but not as a result of planning or the implementation of a strategy
1 – The citizen or their family may need to act as the integrator of service in an unpredictable way

2 – Integration within the same level of care (e.g., primary care)
3 – Integration between care levels (e.g., between primary and secondary care)
4 – Integration includes both social care service and health care service needs
5 – Fully integrated health & social care services.

11. Innovation Management

Objectives:

Many of the best ideas are likely to come from clinicians, nurses and social workers who understand where improvements can be made to existing processes. These innovations need to be recognised, assessed and, where possible, scaled up to provide benefit across the system. At the same time, universities and private sector companies are increasingly willing to engage in open innovation, and innovative procurement, in order to develop new technologies, test process improvements and deliver new services that meet the needs of citizens. There is also value in looking outside the system to other regions and countries that are dealing with the same set of challenges, to learn from their experiences. Overall, this means managing the innovation process to get the best results for the systems of care, and ensuring that good ideas are encouraged and rewarded.

- Adopting proven ideas faster.
- Enabling an atmosphere of innovation from top to bottom, with collection and diffusion of best practice.
- Learning from inside the system, as well as from other regions, to expand thinking and speed up change.
- Involving universities and private sector companies in the innovation process (i.e., 'open innovation').
- Using innovative procurement approaches (Pre-Commercial Procurement, IPP, PPP, Shared Risk, Outcome-Based Payment)
- Using European projects (e.g., Horizon 2020, EIP, CEF).

Assessment scale:

0 – No innovation management in place
1 – Innovation is encouraged but there is no overall plan
2 – Innovations are captured and there are some mechanisms in place to encourage knowledge transfer
3 – Formalised innovation management process is planned and partially implemented
4 – Formalised innovation management process is in place and widely implemented
5 – Extensive open innovation combined with supporting procurement & the diffusion of good practice is in place

12. Capacity Building

Objectives:

Capacity building is the process by which individual and organisations obtain, improve and retain the skills and knowledge needed to do their jobs competently. As the systems of care are transformed, many new roles will need to be created and new skills developed. These will range from technological expertise and project management, to successful change management. The systems of care need to become 'learning systems' that are constantly striving to improve quality, cost and access. They must build their capacity so as to become more adaptable and resilient. As demands continue to change, skills, talent and experience must be retained. This means ensuring that knowledge is captured and used to improve the next set of projects, leading to greater productivity and increasing success.

- Increasing skills; continuous improvement.
- Building a skill base that can bridge the gap and ensure that the capacity needs are understood and addressed by ICT where appropriate

- Providing tools, processes and platforms to allow organisations to assess themselves and build their own capacity to deliver successful change.
- Creating an environment where service improvements are continuously evaluated and delivered for the benefit of the entire care system.

Assessment scale:

0 – Integrated care services are not considered for capacity building
1 – Some systematic approaches to capacity building for integrated care services are in place
2 – Cooperation on capacity building for integrated care is growing across the region
3 – Systematic learning about integrated care and change management is in place but not widely implemented.
4 – Systematic learning about integrated care and change management is widely implemented; knowledge is shared, skills retained and there is a lower turnover of experienced staff.
5 – A 'person-centred learning healthcare system' involving reflection and continuous improvement.

Template

This table helps capturing scores and justifications for the 12 dimensions. It can be used for the assessment by each group member and for the negotiation and consensus building:

Dimension	Score	Justification


READINESS TO CHANGE
STRUCTURE & GOBERNANCE
ICT & EHEALTH SERVICES
STANDARDISATION & SIMPLIFICATION
FUNDING
REMOVAL OF INHIBITORS
POPULATION APPROACH
CITIZEN EMPOWERMENT
EVALUATION METHODS
BREADTH OF AMBITION
INNOVATION MANAGEMENT
CAPACITY BUILDING
1
2
3
4
5
6
7
8
9
10
11
12
0
1
2
3
4
5

Annex VII. Adapted SQUIRE 2.0

The sections in grey are completed in the Pre-implementation phase. Non-colored sections are completed after the post-implementation phase analysis.

Introduction	*Why did you start?*
1. Problem Description	• Nature and significance of the local problem *"Problem/challenge" of the scope definition template*
2. Available knowledge	• Summary of what is currently known about the problem, including relevant previous studies
3. Rationale	• Informal or formal frameworks, models, concepts, and/or theories used to explain the problem, any reasons or assumptions that were used to develop the intervention(s), and reasons why the intervention(s) was expected to work
4. Specific aims	• Purpose of the project and of this report *"General purpose of the intervention" of the scope definition template* *"Objectives" of the collaborative methodology*
Methods	***What did you do?***
5. Context	• Contextual elements considered important at the outset of introducing the intervention(s) *Main output of the Situation Analysis. SWOT analysis*
6. Intervention(s)	• Description of the intervention(s) in sufficient detail that others could reproduce it *"Target population" of the scope definition* *Areas of improvement and Change package of the Collaborative methodology* • Specifics of the team involved in the work *Description of the LIWG participants (number, profiles, roles)*
7. Study of the Intervention(s)	• Approach chosen for assessing the impact of the intervention(s) (quantitative or qualitative analysis) • Approach used to establish whether the observed outcomes were due to the intervention(s)
8. Measures	• Measures chosen for studying processes and outcomes of the intervention(s), including rationale for choosing them, their operational definitions, and their validity and reliability

	Key Performance Indicator of the Collaborative methodology
9. Chronogram	Expected timing of the activities of the Change package, scheduling the start and end month
10. Analysis	• Qualitative and quantitative methods used to draw inferences from the data • Methods for understanding variation within the data, including the effects of time as a variable *PLAN template: How will the data be collected? Explain data sources and quantitative and qualitative methods*
11. Ethical considerations	• Ethical aspects of implementing and studying the intervention(s) and how they were addressed, including, but not limited to, formal ethics review and potential conflict(s) of interest
12. Results	• Intervention(s) and their evolution over time (e.g., time-line diagram, flow chart, or table), including modifications made to the intervention during the project *DO template: What was actually implemented? Any deviation from the planned actions.* *If more than one PDSA cycle, please report the information taking into consideration all cycles.* • Details of the process measures and outcome *STUDY template (only in case that more than one PDSA cycle is implemented) and Impact assessment* • Observed associations between outcomes, interventions, and relevant contextual elements • Unintended consequences such as unexpected benefits, problems, failures, or costs associated with the intervention(s). *STUDY template (only in case that more than one PDSA cycle is implemented) and Impact assessment* • Details about missing data *Impact assessment*
13. Implementation process	• Facilitators and barriers of the implementation process • Set of recommendations for future implementation *Input from the analysis of the implementation process using Consolidated Framework for Implementation Research (CFIR)*
14. Summary	• Key findings, including relevance to the rationale and specific aims

	Impact assessment • Particular strengths of the project
15. Interpretation	• Nature of the association between the intervention(s) and the outcomes • Comparison of results with findings from other publications • Impact of the project on people and systems • Reasons for any differences between observed and anticipated outcomes • Costs and strategic trade-offs, including opportunity costs *Impact assessment*
16. Limitations	• Limits to the generalizability of the work • Factors that might have limited internal validity such as confounding, bias, or imprecision in the design, methods, measurement, or analysis • Efforts made to minimize and adjust for limitations *Impact assessment*
17. Conclusions	• Usefulness of the work • Sustainability • Potential for spread to other contexts • Implications for practice and for further study in the field • Suggested next steps
18. Funding	• Sources of funding that supported this work. Role, if any, of the funding organization in the design, implementation, interpretation, and reporting

Annex VIII. Pre-implementation phase preparation

CSJA. Implementation of a 'Personalized Action Plan' within the Strategy and the Comprehensive Plan for complex chronic patient

Local Implementation Working Group

Functions/roles	Institution, name and surname
Organizer	Rafael Rodríguez Acuña (FPS). International project manager, technical advisor and researcher. Member of the Andalusian team at JA CHRODIS PLUS.
Experts	Manuel Ollero Baturone (SAS): Head of the Internal Medicine Department of the Virgen del Rocío University Hospital. Former Director of the Comprehensive Plan for Integrated Care for Patients with Chronic Diseases of Andalusia. Member of the Spanish Society of Internal Medicine (SEMI). Inmaculada Cosano Prieto (SAS): Director of the Comprehensive Plan for Integrated Care for Patients with Chronic Diseases of Andalusia. Director of the Primary Health Care Centre of La Rinconada (Sevilla Norte Health District). Previously she has been Deputy Medical Director of the Virgen del Rocio Hospital and before, Deputy Director for Health Promotion and Participation at the General Secretary for Public Health, Regional Ministry of Health of Andalusia. Member of the Andalusian team at JA CHRODIS PLUS.
Decision makers	Carmen Lama Herrera (CSJA): Deputy Director of Health Rights and Results Planning. Former Deputy Director for Health Promotion and Participation at the General Secretary for Public Health and Consumers of the Regional Ministry of Health of Andalusia. Member of the Andalusian team at JA CHRODIS PLUS. Ana M. Carriazo (CSJA). Senior Advisor at the Regional Ministry of Health of Andalusia. Former member of the Cabinet of the Regional Minister of Health of Andalusia in charge of International affairs of the Regional Minister. Specialist in Preventive Medicine and Public Health and expert in Statistics. Responsible of coordinating Andalusia Reference Site of the European Innovation Partnership on Active and Healthy Ageing and member of the Executive Board of the Reference Sites Collaborative Network. Member of the Andalusian team at JA CHRODIS PLUS. Eugenio Martínez (CSJA): Chief of Comprehensive Plans of the Regional Ministry of Health of Andalusia.
Front-line stakeholders	Inmaculada Cosano Prieto (SAS): Director of the Comprehensive Plan for Integrated Care for Patients with Chronic Diseases of Andalusia. Director of the Primary Health Care Centre of La Rinconada (Sevilla Norte Health District, Spain). Previously she has been Deputy Medical Director of the Virgen del Rocio Hospital and before, Deputy Director for Health Promotion and Participation at the

	General Secretary for Public Health, Regional Ministry of Health of Andalusia. Member of the Andalusian team at JA CHRODIS PLUS. Juan José Bedoya Belmonte (SAS): Director of the Primary Healthcare Centre "Tiro de Pichón" at the Málaga Primary Healthcare District (Málaga, Spain). Member of the Andalusian team at JA CHRODIS PLUS. María Isabel Casado (SAS). Technical advisor of the Care Strategy of Andalusia.
Implementers	Ana M. Carriazo (CSJA). Senior Advisor at the Regional Ministry of Health of Andalusia. Former member of the Cabinet of the Regional Minister of Health of Andalusia in charge of International affairs of the Regional Minister. Specialist in Preventive Medicine and Public Health and expert in Statistics. Responsible of coordinating Andalusia Reference Site of the European Innovation Partnership on Active and Healthy Ageing and member of the Executive Board of the Reference Sites Collaborative Network. Member of the Andalusian team at JA CHRODIS PLUS. Inmaculada Cosano Prieto (SAS): Director of the Comprehensive Plan for Integrated Care for Patients with Chronic Diseases of Andalusia. Director of the Primary Health Care Centre of La Rinconada (Sevilla Norte Health District, Spain). Previously she has been Deputy Medical Director of the Virgen del Rocio Hospital and before, Deputy Director for Health Promotion and Participation at the General Secretary for Public Health, Regional Ministry of Health of Andalusia. Member of the Andalusian team at JA CHRODIS PLUS. Juan José Bedoya Belmonte (SAS): Director of the Primary Healthcare Centre "Tiro de Pichón" at the Málaga Primary Healthcare District (Málaga, Spain). Member of the Andalusian team at JA CHRODIS PLUS. Rafael Rodríguez Acuña (FPS). International project manager, technical advisor and researcher. Member of the Andalusian team at JA CHRODIS PLUS. In each Andalusian primary healthcare center there are social workers that coordinate Health and Social Services allowing to tackle patient personal situation as a whole.
Patient representatives	Our LIWG includes patients' representatives indirectly. During the development and drawing up of the Andalusian key documents for multimorbid patients treatment and management (the Comprehensive Healthcare Plan for Patients with Chronic Diseases and the Integrated Care Process 'Healthcare for Multimorbidity Patients') all stakeholders were take into consideration. Thus, patient's representatives were involved and consulted in that process being, therefore, their suggestions/needs included the final versions. In addition, Andalusia introduced in 2014 the Action Plan on Citizen Participation in healthcare that allows an active involvement of patients/caregivers/citizens,

	both individual (e.g. through interviews, questioraires, complains…) and collective (e.g. patients associations, NGOs…), in the Andalusian Public Health System at all levels (primary care and specialized care) with the aim of adapting it to each context/environment and, therefore, optimizing patient satisfaction and health outcomes.

Scope

Item	Description
Problem/challenge	Providing personalized care as cornerstone of those actions intended to complex chronic patients (patients with chronic severe health problems, multimorbidity and polypharmacy).
General purpose of the intervention	Systematizing the comprehensive and personalized care of complex chronic patients, while taking into account their personal situation, preferences and life options.
Target population	Complex chronic patients (patients with chronic severe health problems, multimorbidity and polypharmacy) that meet the criteria set in: • The Comprehensive Healthcare Plan for Patients with Chronic Diseases (Plan Andaluz de Atención Integrada a Pacientes con Enfermedades Crónicas-PAAIPEC). • The Integrated Care Process 'Healthcare for Multimorbidity Patients' (Proceso Asistencial Integrado 'Atención a pacientes pluripatológicos'). Target population age group: No age limit[103]
Topic identification: Integrated Care Model Components implemented	• Individualized care plans

A prerequisite for drafting up a PAP in Andalusia is to accomplish a comprehensive assessment of the patient status. During this assessment, an evaluation of patien's health status (e.g. diseases, severity, symptoms), disease prognosis, prescriptions, disease self-management as well as preference and life options are carried out. The evaluation is performed in a systematized way by using those indexes included in the Integrated Care Process 'Healthcare for Multimorbidity Patients' (e.g. Barthel index and Lawton y Brody index for frailty; Pfeiffer test and Mini-Mental State Examination test for cognitive assessment;

[103] Regarding the target population, there isn't a specific age group since multimorbidity may occur in any age range. Thus, PAPs (and therefore the pilot) is intended to those patients that meet the criteria set in the Comprehensive Healthcare Plan for Patients with Chronic Diseases and the Integrated Care Process 'Healthcare for Multimorbidity Patients', irrespective of their age.

STOPP-START test for potentially inappropriate prescription analysis; GES questionary for the assessment of patients' spiritual needs, among others). Moreover, during the comprehensive assessment of the patient status, patient environment is also evaluated, taken into account the available support (formal or informal caregivers) and resources (e.g. economical situation). The participation of caregivers is a very important tool in this assessment since they give a complementary view of patient situation.

In addition, thanks to primary carecenter's social workers, communitary social resources are identified and offered to thoses patients with special needs when required.

SWOT

Strengths	Weaknesses
• Complex chronic patients care is prioritized in the healthcare system, having its own Strategy and aligning with the rest of the strategies. • Existence of an Andalusian Care Model for complex chronic patients. • Existence of a corporative and integrated Information System with a shared electronic health records available throughout the Andalusian public health care system. • Existence of a Health Population Data Base as information source with population stratification capacity. • Universal coverage of the Andalusian public health care system. • Institutional leadership. • Patient-centred healthcare at primary level, with highly trained and specialized professionals. • Patient healthcare based on multidisciplinary teams. • Primary care teams which are used to teamwork working together. • Active commitment of primary and hospital care professionals with chronic patients care.	• Unresolved continuity of care between care levels (inter / intra level). • Lack of time for teamwork. • Limitation on proactive patient care. • Resistance to change of health professionals. • Need to improve the disease self-management by patient and their caregivers. • Resource constraints. • Lack of coordination between healthcare and social services.
Opportunities	**Threats**
• The care of complex chronic patients is, not only a national challenge and priority (for instance, there is a National Strategy), but also an international one (i.e. for the EU, WHO, among others). • Possibility to create synergies with other European initiatives (i.e. EIP on AHA, JA Chrodis Plus, JA Advantage). • There is an European project focus on implementing good practices for chronic diseases (JA Chrodis plus) that will assesses	• The sustainability of public healthcare system is under pressure due to the increase of the population aging and its chronic condition. • Changes in the political situation. • Changes in organizational models • Resistance to change of the population against organizational changes in the public healthcare system.

the impact of the application of the integrated care model for multimorbidity. • Availability of new technologies with potential application for the care of complex chronic patients. • Population awareness for the need of chronic care services intended to complex chronic patients.	

Long term sustainability is included within the "Strengths". Thus this dimension is included in the items "Complex chronic patients care is prioritized in the healthcare system, having its own Strategy and aligning with the rest of the strategies", "Existence of an Andalusian Care Model for complex chronic patients", "Universal coverage of the Andalusian public health care system". Thus, for example, Andalusian comprehensive plans and strategies have a long term view (including not only situation analysis and actions, but also indicators and periodic outcome assessment) due to they are periodically reviewed and updated (after several years of implementation).

Improvement areas

Improvement areas	Priority score (1-3)	Ranking
Lack of data on the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients in their general health status.	3	1
Need to improve the disease self-management by patient and their caregivers.	3	2
Unresolved continuity of care between care levels (inter / intra level).	2	3
Lack of coordination between healthcare and social services.	1	4

Although several **improvement areas** were identified, the **selected** one was "**Lack of data on the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients in their general health status**".

The main reason was that other ones are now tackled in different ways:

- "Need to improve the disease self-management by patient and their caregivers":

  Nowadays, PAP is the key tool for patient disease self-management. PAP is the the result of interviews with patients (and their caregivers) as well as the assessment their personal situation, preferences and life options. Moreover, PAPs are written in such a way that can be easily

understood by patients (regardless of their socioeconomical status, academic level and background) and include signs and symptoms that help them to identify risk situations. In addition, PAP also includes contact telephone numbers for helping patients in the disease self-management when doubts about their disease/treatment appear.

- "Unresolved continuity of care between care levels (inter / intra level)":

  Multimorbidity patients are followed-up and treated by a multidisciplinary teams. These teams include, not only professionals from primary care centers (physicians, nurses, social workers, among others), but also from specialised care centes (mainly internists from their referral hospital) that work together. Periodic meetings/contacts are conducted where the internist contributes in the assessment of the patients' health status. Moreover all health care levels have access to the same information stored in the patients' electronic health record, within the corporate IT system, easing patient follow-up and inter-level coordination.

- "Lack of coordination between healthcare and social services":

  There are social workers in the Andalusian primary care centers. Thus, thanks to these primary care center social workers, communitary social resources are identified and offered to thoses patients with special needs (when required), strengthening the coordination between Health and Social Services.

Change package

Improvement area(s)	Objective(s)	Change Package (Describe the activities)	Person(s) involved /responsible	Timeline (months)	Key performance indicator(s)
Lack of data on the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients in their general health status.	The assessment of the influence of the systematized application of individualized and comprehensive care plans to complex chronic patients, within the framework of the APHS strategies and, and within the scope of the APHC.	Inforamtion sessions for professionals of the Andalusian Health Service	CTM, PHP	Sep - Oct 2018	Y/N.
		Complex chronic patients sample selection.	CTM, PHP	Oct 2018 - Jan 2019	Number of patients included in the sample (target: 200 patients). Number of health districts represented in the sample (target: 8).
		Drawing up and delivering the Individualized care plans.	PHP	Oct 2018 - Jan 2019	Y/N.
		Data analysis.	PHP, ISP, CTM	Oct 2019 - May 2020	Outcome assessment report (Y/N), including, at least, the number of recruited patients, number of individualized care plans, and the rate of unplanned hospitalisation potentially preventable achieved (%) in 12 months.

APHS: Andalusian Public Health System; APHC: Andalusian primary healthcare centers
CTM: core team members; PHP: primary healthcare professionals; ISP: information systems professionals

The data set, that will be the basis of the the assessment, includes:

- Related to the patient
    - Personal information:
        - Date of birth
        - Age (years)
        - Gender
        - Height (cm)
        - Weight (Kg)
- Related to the health services utilization, including dates and number of visits to:
    - Primary healthcare centres (family physicians and primary care nurses)
    - Emergencies
    - Inpatien care
    - Outpatient care
- Related to the caregiver:
    - Personal information:
        - Date of birth
        - Age (years)
        - Gender
        - Height (cm)
        - Weight (Kg)
- Related to the comprehensive assessment of the patient status:
    - Diagnosis (main chronic condition and co-morbidities)
    - Functional and frailty assessment (including Barthel and Lawton y Brody indexes),
    - Cognitive assessment (including Pfeiffer and Mini-Mental State Examination tests),
    - Affective assessment (including Yesavage test),
    - Socio-family assessment (including Gijón scale)
    - Disease prognosis (including PROFUND and PROFUNCTION indexes)
    - Prescriptions assessment (including STOPP-START test for potentially inappropriate prescription analysis),
    - Disease self-management and activation (including NOC criteria),
    - Preference and life options (including GES questionary for the assessment of patients' spiritual needs).

IACS. Aragon Primary Care

Local Implementation Working Group

The Local Implementation Working Group is formed by a total of 34 stakeholders from different areas and institutions.

- There are 4 organizers from IACS who run the secretariat, and 2 from the Government of Aragón who also act as decision makers and provide strategic vision and facilitate the communication with relevant contact persons.

- A total of 19 experts from different institutions inside and outside of Aragón provide their knowledge on training health professionals in multimorbidity and are in charge of the development of an online educational tool that is part of the intervention.

- Up to 10 implementers will be in charge of implementing the intervention following the agreed plan, including the two coordinators of two of the Primary Care Health Centres involved in the implementation and the responsible persons of the Chronic Care Unit at the Hospital. Some of them are also front-line stakeholders who give knowledge and expertise on real-life practice experience.

- Finally, a representative of patients to give input during the pilot action development, implementation and evaluation joint the team from the Aragón Health Council.

A Permanent Committee of the LIWG has been created, conformed by 4 stakeholders in order to facilitate decision making, which could be hindered by the large number of participants in the group.

Functions/roles	Institution, name and surname
Organizer LIWG Permanent Committee components are underlined	Instituto Aragonés de Ciencias de la Salud (IACS) • Alexandra Prados Torres (APT) • Antonio Gimeno Miguel (AGM) • Beatriz Poblador Plou (BPP) • Jorge Navarro López (JNL)

	D.G. de Asistencia Sanitaria. Departamento de Sanidad de Aragón: • María Bestué Cardiel (MBC) • María Isabel Cano del Pozo (MICP)
Experts	Servicio Aragonés de Salud (SALUD): • Luis Andrés Gimeno Feliú (LAGF) • Victoria Pico Soler (VPS) • Inmaculada Guerrero Fernández-de-Alba (IGFA) • Ana Monclús Muro (AMM) • Ana Mª Calvo Gascón (AMCG) D.G. de Asistencia Sanitaria. Departamento de Sanidad de Aragón: • Carmen Chaverri Alamán (CCA) • Mª Luz Lou Alcaine (MLLA) IACS: • Alexandra Prados Torres • Antonio Gimeno Miguel • Beatriz Poblador Plou Servicio Madrileño de Salud: • Isabel del Cura González (IDCG) • Juan Antonio López Rodríguez (JALR) • Cristina Lozano Hernández (CLH) • Milagros Rico Blázquez (MRB) Unidad Docente Multiprofesional de Atención Familiar y Comunitaria. Distrito de Málaga. Consejería de Salud. Junta de Andalucía: • Juan Daniel Prados Torres (JDPT) • Francisca Leiva Fernández (FLF) IAVANTE. Consejería de Salud. Junta de Andalucía: • Teresa Martínez-Cañavate López-Montes (TML) Servicio Andaluz de Salud. Distrito Sanitario Málaga/Guadalhorce. Consejería de Salud. Junta de Andalucía • Mª José Bujalance Zafra (MJBZ) • Fernando López Verde (FLV)

Decision makers	D.G. de Asistencia Sanitaria. Departamento de Sanidad de Aragón: • María Isabel Cano del Pozo • María Bestué Cardiel
Front-line stakeholders	D.G. de Asistencia Sanitaria. Departamento de Sanidad de Aragón: • Luis Gómez Ponce (LGP) • Carmen Chaverri Alamán SALUD: • José María Arnal Alonso (JMAA) • Carolina Mendi Metola (CMM) • Óscar Navarro Vitalla (ONV) • María Luisa Martínez López (MLML)
Implementers	SALUD: • Carolina Mendi Metola • Óscar Navarro Vitalla • María Luisa Martínez López • Susana García Domínguez (SGD) • Carmen Puig García (CPG) • Esther del Corral Beamonte (ECB) • Isabel Martín Algora (IMA) • María Jesús Pardo Díez (MJPD) • Fabiola Díez Masso (FDM) D.G. de Asistencia Sanitaria. Departamento de Sanidad de Aragón: • Carmen Chaverri Alamán
Patient representatives	Consejo de Salud Torrero-La Paz, Consejo de Salud de Aragón • Mª Ángeles Cardiel (MAC)

Scope

Item	Description
Problem/challenge	In Spain, Primary Care serves as the gatekeeper of patients into the healthcare system. However, once inside the health system, multimorbid patients who represent around 80% of the population aged ≥65 years in

	Aragón, navigate within the healthcare system and from one specialty to another, leading to potential fragmentation of care. This is potentially due to lack of integration between primary and hospital care services and to the need for a figure acting as a case manager of the patient who knows her/his entire clinical and social context and develops a patient-centred individualized intervention plan. The fragmentation of care may enhance the negative impact on health of multimorbidity, resulting in higher mortality, unexpected or inappropriate use of healthcare services as increased number of hospitalizations, early readmissions, and decreased quality of life. The associated polypharmacy has also been related to increased risk of adverse drug reactions and low adherence. All of this has also been shown to increase public health costs. The health status of general population in Aragón in terms of prevalence of multimorbidity, polypharmacy and specific chronic conditions, as well as the use of health services, has been described in the EpiChron Cohort, highlighting that multimorbidity is suffered by a high percentage of the population. Multimorbidity was found to be strongly related to the occurrence of adverse drug events, as far as it requires the intervention of different specialists and the prescription of multiple medications. The nature and impact of comorbidities in patients with a given chronic disease has also been investigated. The coexistence of mental comorbidity in patients with type 2 diabetes was shown to increase the number of unplanned hospital admissions, and discordant comorbidities had an important effect on specialist care use. On the other hand, although Spanish healthcare professionals are very well trained to manage specific chronic diseases, they are not specifically trained to manage patients with multimorbidity and polypharmacy and to adopt patient-centred care and shared-decision making taking into account patient´s preferences, needs and expectations. Training needs of professionals on managing multimorbidity have been identified in the context of a Spanish multi-centre randomized clinical trial that assesses the effectiveness of a complex intervention in Primary Care to improve medication appropriateness in multimorbid patients. This situation makes it necessary to adopt organizational, healthcare and formative measures in Aragon´s healthcare system to minimize the fragmentation of care perceived by multimorbid patients and to improve health professionals´ skills on multimorbidity, polypharmacy and patient-centred care.
General purpose of the intervention	The intervention to be implemented in Aragón aims to address the problem of managing multimorbid complex patients in Primary Care, in close collaboration also with Hospital Care. We want to address this issue by

	reorienting the provision of health services, adapting the organization of health system to ensure continuity of care through better coordination with hospital services to satisfy the real needs of this population group; and by training healthcare professionals to manage multimorbidity. The main aim is to decrease the impact of multimorbidity in health outcomes, by increasing continuity of care and by training healthcare providers in multimorbidity and patient-centred care.
Target population	The intervention will be directed to patients aged ≥65 years with multimorbidity and polypharmacy included in the Aragon Complex Chronic Patient Care Program using a stratification strategy.
Topic identification: Integrated Care Model Components implemented	In order to achieve the general purpose of our intervention, the following components of the Integrated Care Model for Multimorbidity have been identified as key points of the intervention and will be addressed: <u>Delivery of the care model system:</u> • *Regular comprehensive assessment of patients.* This assessment performed by the Primary Care team has to be comprehensive from the clinical, and social point of view, and by needs. • *Multidisciplinary, coordinated team.* Multidisciplinary primary care teams (doctor and nurse) are already conformed. It is a structural feature, and not a new objective. • *Case manager.* Appointment of a professional (primary care team) as coordinator of the individualized care plan acting as a case manager. *Individualized care plans.* Establishment of individualized care plan for each patient.<u>Decision support</u> • *Implementation of evidence based practice.* The implementation of evidence based practice is performed in usual care through the use of clinical practice guidelines for specific chronic diseases, which are useful for decision support, but they not take into account the reality of multimorbidity and multiple chronic conditions. The implementation of evidence based practice in the context of multimorbidity will not be covered by our intervention. • *Training members of the multidisciplinary team.* Training members of the multidisciplinary team specifically focused on multimorbidity, polypharmacy and patient-centred care. *Developing a consultation system to consult professional experts.* Based on ICTs.<u>Self-management support</u> • *Training of care providers to tailor self-management support based on patient preferences and competencies.* • *Shared decision making.*

	These two components will be indirectly addressed by training healthcare professionals in communication skills and person-centred approach.<u>Information systems and technology</u> • *Exchange of patient information.* Exchange of patient information between care providers by compatible clinical information systems to ensure continuity between primary and specialized care and avoid displacement of patients. • *Electronic patient records and computerized clinical charts.* Electronic patient's records are already used. A specific module to be integrated in the software used to register patient electronic medical records in primary care will be developed to record additional clinical and social information. • *Uniform coding of patients´ health problems.* Patients´ health problems are already coded using ICPC codes in primary care and ICD codes in hospital care. <u>Social and community resources</u> Although *supporting access to community- and social- resources* and *involvement of social network* have also been identified in the SWOT analysis as an important part of the care model for multimorbidity, this dimension is not expected to be specifically covered in our intervention because its approach is linked to planning decision out of our field of decision. However, the specific strategies and programs existing in Aragón will be taken into account during the implementation.

SWOT

Strengths	Weaknesses
• Existence of a Strategy for Complex Chronic Patients in Aragón. • Primary Care process can be organised in a longitudinal way, the problems of a given patient can be addressed one by one. • Primary Care teamwork. • Existence of an assigned list of patients per doctor (quota). • Existence of the role of case manager or professional of reference in Primary Care. • Coordination mechanisms established between Primary and Specialized Care. • Each level of care has its function and definition of tasks. • Improving healthcare of chronic patients is a need felt by healthcare professionals. • Primary Care has a very close view of the context of the patient. • Multidisciplinary approach. • Policy aligned with the priorities of the Health Department in chronicity as a strategic line. • Policy towards integrated medical history with a defined timeline. • Trust relationship between Primary Care professionals and their assigned patients. • Existence of an individualized and comprehensive electronic medical record in all healthcare levels. • Primary Care professionals are trained with a competence profile of chronic care. • Existence of a culture of implementing protocols in Primary Care. • Existence of multi-professional teaching units. • We have the validated educational tool e-MultiPAP at the right time. • The educational tool has already been tested in two editions with satisfactory results.	• Variability among regional health systems. • Healthcare to patients with multimorbidity is fragmented among healthcare professionals and levels of care. • There is not enough culture of coordination between different healthcare levels. • Reticence to change of healthcare professionals. • Difficulty in establishing professional incentives. • Primary Care´s work is not sufficiently recognized by the system or by society. • Insufficient communication of the chronicity care model to healthcare professionals. • Difficulty for standardizing professional training. • Unmet needs of Health professionals need joint (Family Medicine and Nursing) training in multimorbidity. • Limited incorporation of social context to health. • Lack of coordination among strategies between different levels of care and territories. • Lack of knowledge and of uniformity and homogeneity in definitions (e.g., multimorbidity, pluripathology, complex). • Conflict of roles. • Scarce medical consultation time available. • Poor information systems on social determinants. • Different responses from different levels regarding the elaboration of the project. • Lack of Budget, in general. • Perception of imposition from top to bottom for health professionals. • Not sufficiently integrated clinical information. • Lack of hospital structure to implement a specific reference unit for complex chronic patients.

	• Isolated work routines between Family Medicine and Nursing. • Burnt out/overworked health professionals. • Computer bureaucracy during medical consultations. • Difficulty for working in real time between Family Medicine and Nursing. • Health Resources and training policy not aligned with this program. • Unawareness of the potential of the half stay. • Educational tool not sufficiently directed to nursing or to the chronic complex at the moment. • Lack of identification of social needs in patients. • Lack of real vision of the problem. • Health professionals see the training as an obligation and not as a right. • To forget about the local context during the implementation. • Lack of knowledge of the subject by health professionals. • Scarcity of resources for the social part. • Lack of continuity of healthcare due to instability of health professionals´ teams.
Opportunities	Threats
• Primary Care model in the framework of a National Health System. • Health coverage is universal. • Primary Care is the gateway to the Healthcare System in Spain. • Primary Care is strongly implanted. • Europe and Spain are increasing their interest in improving healthcare of multimorbid patients. • Existence of a National Strategy for Chronicity in Spain. • Existence of a Research Group on multimorbidity. • Existence of a culture of alignment among the research group, policy makers and Primary Care professionals. • Existence of a validated standardized educational tool on multimorbidity (e-MultiPAP) precedent of a clinical trial. • The educational tool has been revised to be useful also for nurses and not only for doctors. • Existence of a plan of renewing IT equipment.	• Multimorbidity is not recognised as a Public Health problem. • Unawareness of the relevance of the multimorbidity phenomenon among professionals and policy makers. • Multimorbidity is a growing phenomenon. • Multimorbidity can act as a risk factor of worsening health outcomes. • Lack of scientific evidence and overlapping of different interventions in multimorbidity. • Changing and unknown needs of patients with multimorbidity. • Possible resistance of some care settings (e.g., Internal Medicine Service). • Hospital-centrism based budgets. • Restriction of human and economic resources, especially in Primary Care. • There are no special resources allocated to this program. • Lack of continuity in health policies, short-term policies. • Lack of acceptability of the educational tool by health professionals, maybe they do not see it useful.

• Existence of a theoretical/ conceptual reference framework (Ariadne principles). • Great current awareness of the problem of multimorbidity and that the current approach is not sufficiently good. • Participation in Chrodis-Plus: a European project with different health systems, mutual learning, and shared experiences. • Integration of two public projects at national (Multi-PAP) and European (Chrodis-Plus) level. • Empowerment of Primary Care is recognized by the society. • Patients are increasingly aware of their needs and they demand health. • Sharing spaces of clinical attention between Primary-Specialized Care. • Opportunity for revival the Family Care Unit. • Role of recognized influencers in person-centred care. • Opportunity for change for nursing professional role. • Model of community care in Aragon, in parallel. • Opportunity of self-criticism of what we have been doing until now. • Development of ICTs in health that bring professionals and patients closer. • Patients are increasing the use of ICTs and their health literacy. • Multimorbidity is a MeSH term since January 2018. • Opportunity for scaling up the model to all multimorbid population.	• Some expectations of health professionals are not covered by the current system. • Reductionism of chronicity approach to the complex chronic patient instead to multimorbid. • Excessive use of emergency services by chronic population. • Lack of political and social recognition of family and community nursing as specialty and institution. • Pressure from the pharmaceutical industry and its own interests. • Re-allocation of budget to digitalization and TICs. • Mainly a biomedical strategy, forgetting about the social context. • Lack of measures to guarantee the sustainability of interventions. • No educational intervention fits all. • Lack of definition and overlapping of roles for the attention to chronicity. • Political changes and instability.

Improvement areas

To overcome the weaknesses and threats identified during the SWOT analysis when performing the SWOT analysis, the following improvement areas for the implementation of the integrated care model for multimorbidity have been selected, which are ordered from highest to lowest priority:

Improvement areas	Priority score (1-3)	Ranking
Training of healthcare professionals to adequately manage multimorbidity in clinical practice from a patient-centred focus by means of a standardized educational online tool specifically designed by and for health professionals.	3	1
Fragmentation of care among healthcare professionals and levels suffered by multimorbid patients in the clinical practice. Improvement of continuity of care by means of redefining the role of the multidisciplinary primary care team, the identification of this team as case manager for each patient, and the conformation of a specific care unit in the hospital to facilitate the direct communication between Primary and Hospital Care.	3	2
Integration and sharing of relevant clinical information of patients among health professionals from Primary and Hospital Care through the development of a module of information to be included in the software of EHRs, and the development of a consultation system to consult professional experts.	2	3
Comprehensive assessment of multimorbid patients focusing on his/her needs and translate it into an individualized care plan and proactive follow-up.	1	4

Change package

The interventions to be implemented are described below:

Development of an online 5-week training course on multimorbidity, polypharmacy and patient-centred care (e-MultiPAP) designed by and for health professionals, which has been validated in the context of a multicentric national RCT.

- Definition of the team acting as a case manager of the patient conformed by the family physician and the nurse.
- Definition of the personnel of reference for chronic patients at specialized care level at a chronic care unit depending of the Internal Medicine Service to which patients seen in primary care can be directly derived for specific consultations, procedures and/or tests.
- Development of a virtual interconsultation system to consult professional experts outside the Primary Care team.
- Development of a module of gathering information to be shared among professionals and integration in the Primary Care EHRs.
- Development of an individualized care plan at patient level based on the comprehensive assessment by the primary care team taking into account patient´s needs and preferences, and proactive follow-up of patients. The comprehensive assessment will include clinical, care needs, functional, cognitive, socio-sanitary, and pharmacological assessments, using specific

tools/questionnaires such as the Virginia Henderson model, the Barthel index, the Lawton Brody scale, the Lobo´s Mini Cognitive Exam, or the sociofamiliar scale of Gijón.

Improvement area 1: Fragmentation of care among healthcare professionals and levels suffered by multimorbid patients in the clinical practice.

Objective(s)	To improve continuity of care and communication among healthcare professionals and levels of care to reduce negative health outcomes.
Change Package	• Definition of the team acting as a case manager of the patient conformed by the family physician and the nurse. • Definition of the personnel of reference for chronic patients at specialized care level.
Person(s) involved/responsible	SGD, CPG Responsible: CMM ECB, IMA, MJPD, FDM Responsible: JMAA
Timeline (months)	Oct 2018– Feb 2019
Key performance indicator(s)	• Existence of a document that describes the functions/role of case manager: Y/N • % of patients included in the program with case manager formally identified. • Number of Primary Care teams included in the program. • Implementation of a chronic care unit at the hospital: Y/N • Identification of personnel of reference at the chronic care unit: Y/N • Number of admissions to the emergency room in 12 months • Number of hospitalizations in 12 months. • Number of avoidable hospitalizations in 12 months

Improvement area 2: Training of healthcare professionals to adequately manage multimorbidity in clinical practice from a patient-centred focus.

Objective(s)	To improve skills in multimorbidity, polypharmacy and patient-centred care of healthcare professionals to adequately manage multimorbidity in clinical practice.
Change Package	• Development of an online 5-week training course (e-MultiPAP) designed by and for health professionals.
Person(s) involved/responsible	JDPT, FLF, TML, LAGF, VPS, FLV, MJBZ, CLH, CCA, MRB, AMM, APT, AGM, BPP, AMCG, JALR, IGFA Responsible: APT, JDPT, IDCG

Timeline (months)	Oct–Dec 2018
Key performance indicator(s)	• Number of health professionals who initiate the course. • Number of health professionals who finish the course. • Increment of knowledge as the difference of mark in a test on skills in multimorbidity done before and after the course. • Satisfaction of the course by health professionals (mark given to the course).

Improvement area 3: Integration and sharing of relevant clinical information of patients among health professionals from Primary and Hospital Care.

Objective(s)	To improve continuity of care and communication among healthcare professionals and levels of care to reduce negative health outcomes.
Change Package	• Development of a virtual interconsultation system to consult professional experts outside the Primary Care team. • Development of a module of information to be shared among professionals and integration in the Primary Care EHRs.
Person(s) involved/responsible	Outside LIWG Responsible: MICP, MBC
Timeline (months)	Oct 2018
Key performance indicator(s)	• Number of interconsultations/patient. • Number of interconsultations / 12 months. • % of interconsultations to professional of reference/total consultations to all specialties. • % of response to questions in less than 48 hours. • Existence of a module of information shared among professionals in the EHRs: Y/N

Improvement area 4: Comprehensive assessment of multimorbid patients and proactive follow-up.

Objective(s)	To improve continuity of care and communication among healthcare professionals and levels of care to reduce negative health outcomes.
Change Package	• Development of an individualized care plan at patient level based on the comprehensive assessment by primary care team, and proactive follow-up of patients.
Person(s) involved/responsible	PC Teams (outside LIWG) Responsible: SGD, CPG, CMM, ONV
Timeline (months)	Oct 2018–Oct 2019
Key performance indicator(s)	• % of patients with individualized care plan based on a comprehensive assessment. • Number of visits to Primary Care team in 12 months per patient.

UCSC. Multimorbidity Care Model in elders with dementia and adults with intellectual disability

Local Implementation Working Group

Functions/roles	Institution, name and surname
Organizer	Catholic University of the Sacred Heart, Geriatrician, Graziano Onder Catholic University of the Sacred Heart, Geriatrician , Angelo Carfì Catholic University of the Sacred Heart, Health Economist, Carmen Angioletti Catholic University of the Sacred Heart, Epidemiologist, Katie Palmer
Experts	Catholic University of the Sacred Heart, Geriatrician, Graziano Onder Catholic University of the Sacred Heart, Health Economist, Carmen Angioletti
Decision makers	Catholic University of the Sacred Heart, Geriatrician , Graziano Onder
Front-line stakeholders	Catholic University of the Sacred Heart, Geriatrician , Angelo Carfì Catholic University of the Sacred Heart, Geriatrician , Camilla Cipriani Catholic University of the Sacred Heart, Neurologist, Alessandra Lauria Catholic University of the Sacred Heart, Psychologist GPs
Implementers	Catholic University of the Sacred Heart, Secretary, Antonio Panetta Catholic University of the Sacred Heart, Nursing Coordinator, Rosalba Latorre Catholic University of the Sacred Heart, Geriatrician , Angelo Carfì Catholic University of the Sacred Heart, Health Economist, Carmen Angioletti Catholic University of the Sacred Heart, Geriatrician, Camilla Cipriani Catholic University of the Sacred Heart, Neurologist, Alessandra Lauria Catholic University of the Sacred Heart, Psychologist Catholic University of the Sacred Heart, Case Manager, Geriatrician, Eleonora Meloni
Patient representatives	“Associazione Italiana Persone Down”- AIPD; “Associazione Italiana Malattia di Alzheimer”- A.I.M.A. Patient’s family members

Scope

Item	Description

Problem/challenge	Elders with dementia and adults with intellectual disability are characterized by complex health needs, multi morbidity and polypharmacy. The present pilot study is going to be set up in a day hospital outpatient clinic in Rome. The day hospital represent a reference point for patients over 65 suffering from multiple pathologies (multimorbidity) during the exacerbation phase. Patients are usually from the territory, from the clinic or identified as Silver Code (frail elderly at risk of losing functional autonomy) from the emergency room and addressed to the DH or as discharge protected by other departments (for Acuti and Rehabilitation). In our clinic we address subjects with dementia and intellectual disability including Down syndrome. The day hospital takes care of 500 AD and 150 DS patient- years. In a usual care setting they often experience poor case coordination, and frequently don't have a reference care provider and necessary information and support to improve their self-management. Being in need of specialized care, they experience unnecessary referrals, long waiting times at the office and care fragmentation. Furthermore, in big urban context they also are exposed to long trips to the hospital care, missed appointments etc...
General purpose of the intervention	Aim of the pilot study is to improve case coordination, and provide patients with a reference care provider. This goal would be accomplished with the introduction in the care process of a case manager. Another improvement area is the accessibility of care. This would be realized with the implementation of a technocare service. We would like to involve patients and their families to improve self-management. Finally evaluation of complex patients should be standardized through the routine use of comprehensive geriatric assessment tools
Target population	The present pilot study is going to be set up in a day hospital outpatient clinic in Rome. In our clinic we address subjects with dementia and intellectual disability including Down syndrome. The day hospital takes care of 500 AD and 150 DS patient- years.
Topic identification: Integrated Care Model Components implemented	• *Regular comprehensive assessment of patients* • *Multidisciplinary, coordinated team* • *Case manager* • *Care providers – patients group meetings to improve self-management* • *Patient-operated technology allowing patients to send information to their care providers*

SWOT

Strengths	Weaknesses
• Flexibility in working time • Professionals motivation related to improve quality of patient care • Professionals expertise on the management of multimorbidity • Excellent management of emergencies	• Poor care coordination • Difficult accessibility to care: -Unnecessary referrals to the hospital due to difficult management of specific therapies by general practitioners -Long waiting time due to poor scheduling of visits • Hospital difficult to reach by many patients (metropolitan area) • Lack of informative material for patients and caregiver • Lack of understanding of conditions and compliance to therapies by patients and family caregivers
Opportunities	**Threats**
• Available policies on chronic diseases at the national level • Technocare service to reduce unnecessary refferrals • Implementation of scientific research (role as IRCSS) • Improve patient's education • Collaboration with patient associations	• Lack of resources in the present hospital economic situation • Lack of specialized structures for patients with dementia to provide relief of caregiver stress • Lack of incentives for general practitioners

Improvement areas

Improvement areas	Priority score (1-3)	Ranking
Accessibility of care	3	4
Patients and family information and envolvement in process of care	3	3
Poor case coordination, the patient doesn't have a reference care provider	3	2
Fragmentation of care; necessity of multidisciplinary approach	3	1

Change package

Improvement area(s)	Objective(s)	Change Package	Person(s) involved /responsible	Timeline (months)	Key performance indicator(s)
Poor case coordination. The patient doesn't have a reference care provider	Improve communication and coordination of care among members of a health care team and patients.	• 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	Responsible: Graziano Onder Implementers: Geriatricians	**12 months**	-Reduction of unnecessary referrals (number of patients with AD and DS readmitted within 28 day/ number of patients with AD and DS). -Reduction of accessibility in Emergency Department (ED) and subsequent hospitalizations (number of ED admission for patients with AD and DS/ number of patients with AD and DS) -Percentage of drop-outs (number of missing appointments by patients with AD and DS/ number of fixed appointment for patients with AD and DS) -Pre- post customer satisfaction through survey and focus groups with patients, family members and health professionals
Accessibility of care	Make services more readily available or convenient for people with limited mobility, time or transportation options.	• Create a Convenient and Effective technocare work station • Define technocare procedure including eligibility criteria • Acquire informed consent from patients	Responsible: Graziano Onder Implementers: Secretary, Case manager, Geriatricians	**12 months**	-Average number of contacts recorded in the reference period: 12 months -Percentage of extra contacts for Lazio region (number of extra region patients with AD and DS/ number of patients with AD and DS) -Percentage of drop-outs (Percentage of patients with AD and DS who disattend the fixed technocare appointment/ number of patients with AD and DS who fixed technocare appointment) -Percentage of rescheduled techno visits (Percentage of rescheduled visits for patients with AD and DS/ number of patients with AD and DS who fixed technocare appointment)

					- Pre- post customer satisfaction through survey and focus groups with patients, family members and health professionals
Fragmentation of care	Evaluate patients with a comprehensive assessment tool including all clinically relevant domains and possibly assisting health professionals and caregivers to spot undetected care needs	Patients with AD and DS will be routinely assessed with InterRAI-CA and InterRAI-ID tools respectively	Responsible: Graziano Onder Implementers: Geriatricians, Neurologist, Psychologist, nursing coordinator, case manager, GPs, patient's associations?	**12 months**	- Pre- post customer satisfaction through survey and focus groups with patients, family members and health professionals
Improve patient self – management	Providing options for patients and families to improve their self –management. This includes offering approaches to strengthen patients' self-management and self-efficacy, including explaining their diagnoses, diseases, and medical conditions, as well as providing information on medication use, and training patients to use medical devices, supportive aids, and health monitoring tools correctly (for example, blood pressure and glucose monitoring tools etc).	Provide group meetings and training courses for patients and family members. N.B. Education should be personalized to the patients, consistent with their individualized care plans, taking into account their knowledge, educational level, health literacy, and functional aspects (such as whether they have visual problems or cognitive impairment, which might affect comprehension). Identification of a dedicated space	Responsible: Graziano Onder Implementers: Neurologist, Case manager, Psychologist	**12 months**	-Number of patient with AD and DS that partecipate at the group meeting - Pre- post customer satisfaction through survey and focus groups with patients, family members and health professionals

Kauno Klinicos

Local Implementation Working Group

Functions/roles	Institution, name and surname
Organizer	Lithuanian University of health sciences clinics "Kauno klinikos" Ida Liseckienė Assooc. Prof., administrator and family physician Leonas Valius Prof., the head of the Family medicine department
Experts	Primary health care team: Gediminas Urbonas MD, PhD, family physician, experienced in clinical trials as principle investigator Laimutis Gedminas family physician, experienced in clinical trials as principle investigator, working in IT hospital team Ida Liseckienė Assooc. Prof., administrator and family physician Leonas Valius Prof., the head of the Family medicine department Simona Kusleikiene primary care psychiatrist, lecturer Kornelijus Andrijauskas MD, PhD, family physician Jurate Ezelskiene advanced nurse practitioner, have experience in administration Tertiary level specialists team: Jurgita Plisiene prof. MD, PhD, cardiologist, the head of ambulatory care in Cardiology department Džilda Veličkienė prof. MD, PhD, endocrinologist, the head of ambulatory care in Endocrinology department Krisitina Biekšienė assoc. prof., MD PhD pulmonologist
Decision makers	Ida Liseckienė Assooc. Prof., administrator and family physician Leonas Valius Prof., the head of the Family medicine department
Front-line stakeholders	Primary health care team: Gediminas Urbonas MD, PhD, family physician, experienced in clinical trials as principle investigator Laimutis Gedminas family physician, experienced in clinical trials as principle investigator, working in IT hospital team Ida Liseckienė Assooc. Prof., administrator and family physician Leonas Valius Prof., the head of the Family medicine department Simona Kusleikiene primary care psychiatrist, lecturer Kornelijus Andrijauskas MD, PhD, family physician Jurate Ezelskiene advanced nurse practitioner, have experience in administration Tertiary level specialists team: Jurgita Plisiene prof. MD, PhD, cardiologist, the head of ambulatory care in Cardiology department Džilda Veličkienė prof. MD, PhD, endocrinologist, the head of ambulatory care in Endocrinology department Krisitina Biekšienė assoc. prof., MD PhD pulmonologist

Implementers	Primary health care team: Gediminas Urbonas MD, PhD, family physician, experienced in clinical trials as principle investigator Laimutis Gedminas family physician, experienced in clinical trials as principle investigator, working in IT hospital team Ida Liseckienė Assooc. Prof., administrator and family physician Leonas Valius Prof., the head of the Family medicine department Simona Kusleikiene primary care psychiatrist, lecturer Kornelijus Andrijauskas MD, PhD, family physician Jurate Ezelskiene advanced nurse practitioner, have experience in administration Tertiary level specialists team: Jurgita Plisiene prof. MD, PhD, cardiologist, the head of ambulatory care in Cardiology department Džilda Veličkienė prof. MD, PhD, endocrinologist, the head of ambulatory care in Endocrinology department Krisitina Biekšienė assoc. prof., MD PhD pulmonologist Two masters' students of advanced nursing, who will be responsible for the patient's questionnaires (social care and screening for mental health care problems): Ivona Ivasko and Ramute Miceviciene
Patient representatives	Representative of patient organization

Scope

Item	Description
Problem/challenge	According to Joint Action CHRODIS results, at the age of 65 and over, the prevalence of multimorbidity in the Lithuanian population was 42% and at the age of 85 it was above 62%. Even more, related results revealed more than 10% of the population already having at least two chronic conditions at the age of 45 and over (Navickas, R., et al., Prevalence and structure of multiple chronic conditions in Lithuanian population and the distribution of the associated healthcare resources. Eur J Intern Med, 2015. 26(3): p. 160-8.) . The integrated health care is missing in the country and it is highly fragmented, the team work in primary care level is missing: the nurse role in primary health care is not clarified and is being duplicated by family physician. (Jaruseviciene L, Liseckiene I., Valius L., Kontrimiene A., Jarusevicius G. and Lapao L.V. 2013: Teamwork in primary care: perspectives of general practitioners and community nurses in Lithuania. BMC Family Practice 14, 118), who is responsible for all: physical, mental ant health care. The system needs a new case manager in primary health care system, aiming to support the coordination of patients and orientation towards his needs. Newly presented advanced nurse practitioner may take a new case manager role and to perform independently consultations for the patients working in teams with family physician. Summarizing, there is an obvious need to present a new collaboration model in the country and to perform the best care for multimorbid patients presenting holistic and patients oriented care with a new – case manager and presenting direct and timely family doctor- specialists (doctor-doctor) consultations. The integrated health care

	should be more appropriate for the health care professionals as well, reducing patients demands for more frequent and unplanned visits, as well for the health care costs (reducing rehospitalizations, polypharmacy and etc.).
General purpose of the intervention	The Joint Action CHRODIS developed a framework for care of patients with multimorbidity potentially applicable across Europe (Palmer et al. Health Policy 2018), the ICMM. This model identifies sixteen components across five domains: Delivery of Care, Decision Support, Self-Management Support, Information Systems and Technology, and Social and Community Resources). All the components will be included in pilot action.
Target population	MM patients, selected from primary health care clinics (in intervention sites Kauno Klinikos Family medicine department and Kaltinenai PHC centre) Aged: 40-75 years 2 and more chronic conditions at least from two following systems: I I11 ; I20 ; I25 ; I50 ; I48 II E11 III E06.3 ; E89 IV J44; J45 V M05; M15-M19; M80; M81; M54 VI G54; G55
Topic identification: Integrated Care Model Components implemented	This model identifies following components: • Delivery of Care • Decision Support • Self-Management Support • Information Systems and Technology,Social and Community Resources.

SWOT

Strengths	Weaknesses
• National e-health records (started since 2017) • Availability of the e protocols and treatment guidelines • Continuity of care at PHC • Patients involvement in health care (collaboration) • Community and/or advanced nurse (or trained)- as a case manager • To present doctor –doctor (i.e.family physicians and and specialists consultations) • Adopt e-patients records for holistic care	• The accessibility to family physician and specialist is problematic • Lack of teamwork (lack of education and practise) • Fragmentation of health care: the psychosocial services are separated • Huge workloads • Lack of cooperation and confidence between specialist and family physicians (lack of cooperation) • Lack of motivation and practise for case manager • High patients' expectations • Resistance from medical personnel for changes • Resistance of policy makers
Opportunities	Threats

• Education on integrated care for primary health care teams and specialists • Support of "Kauno klinikos" administration • Cooperation between family physicians and doctor-specialists • Cooperation with Chrodis+ different pilot sites • Individualised patient care plan presentation • Empowerment of case manager- nurse • The Lithuanian MoH may support ICMM integration. • A multimorbidity care model was created to improve patients with multimorbidity health-care quality.	• The legislations restrictions to perform wider health services in primary health care level. • Local policies may be not up to date • One-year period for the evaluation of the model may be challenging for the presentation of the results • If the model will succeed, the position of policy makers to implement it in national level may be limited

*LT Health system law - https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.5905/vquxCJSFbC?positionInSearchResults=1&searchModelUUID=89ef1606-17d7-4e6f-b910-806fe58e02a6

*Law of Republic of Lithuania on Municipal health supervision - https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.463684/UshekyEAQN?positionInSearchResults=3&searchModelUUID=89ef1606-17d7-4e6f-b910-806fe58e02a6

Improvement areas

Improvement areas	Priority score (1-3)	Ranking
Integrated and individualized health care plans for multimorbid patient	2	2
Identification of a Case-manager (nurse) at Primary care level	3	3
Multidisciplinary team establishment: communication among healthcare professionals/decision support system for healthcare professionals/ consultation system to be advised by professional experts	4	4
Training program for medical providers who involved in MM patients care	1	1

Change package

Improvement area(s)	Objective(s)	Change Package Describe the activities	Person(s) involved /responsible	Timeline (months)	Key performance indicator(s)
Integrated and individualized health care plans for multimorbid patient	To perform holistic patient assessment in primary care and follow up. To review and update individualized care plan during the regular patients assessments	A personalized protocol for patient care plan. A case manager will be responsible for all the listed actions.	PHC team (family physician, nurses) and psychiatrists and social workers upon the need	M14-M19	EQ-5D questionnaire PACIC questionnaire Screening for mental illness, social problems and *polypharmacy.* *The evaluation of number of visits (including unplanned visits) and hospitalization prior the implementation and after.*
Multidisciplinary team establishment: communication among healthcare professionals/decision support system for healthcare professionals/ consultation system to be advised by professional experts	To present a new roles for nurses (i.e. advanced nurse practitioners) who will be responsible for the comprehensive and continues patients oriented health care . To produce the guidelines for the multidisciplinary team.	A protocol for a Case-manager (nurse) The education and empowerment will be presented before the pilot	PHC TEAM and doctor-specialists	M14-M19	*Focus group discussion for nurses before and after the pilot (assessing the changes in their roles)*

	Establishment Multidisciplinary team				
Training program for medical providers who involved in MM patients care	To develop a new training program for for medical profesionals who involved in MM patients care	New educational Program for doctors, nurses, students: The experts in fields such as social care, teamwork, MM care, polypharmacy management will be invited in the program	The project participants: PHC physicians, nurses, and specialists	M14-M19 The initial program before the pilot implementation and the final program (update according pilot results) and present it for continues medical education program within Univeristy level	Continues medical education program presentation in Lithuanian Univeristy of medical Scienses (for physicians, nurses, advanced nurses, resident doctors)

VULSK. Family Medicine Center, Primary care

Local Implementation Working Group

Functions/roles	Institution, name and surname
Organizer	Vilnius University Hospital Santaros Klinikos (VUH SK) Rokas Navickas MD, PhD, cardiologist, expert in Health Economics, Outcomes and Management in Cardiovascular diseases. Laimis Dambrauskas Administrator of pharmaceutical activities, MPharm, Department of Clinical Pharmacology, Vilnius University Hospital Santaros Klinikos
Experts	Developing a consultation system to be advised by professional experts: Vytautas Kasiulevičius Director of the Family medicine centre of Vilnius University Hospital Santaros klinikos. Assoc. prof. of Medical faculty of Vilnius University Rokas Navickas MD, PhD, cardiologist, expert in Health Economics, Outcomes and Management in Cardiovascular diseases. Centre of Angiology and Cardiology, Vilnius Univeristy Hospital Santaros klinikos Elena Jurevičienė, MD, Head of the Centre for Competencies and Biomedical Research, Pulmonologist, Vilnius Univeristy Hospital Santaros klinikos Žydrūnė Visockienė, MD, PhD, Head of the Endocrinology Department, Vilnius Univeristy Hospital Santaros klinikos, Associated Professor at Vilnius University,
Decision makers	Vytautas Kasiulevičius Director of the Family medicine centre of Vilnius University Hospital Santaros klinikos. Assoc. prof. of Medical faculty of Vilnius University Elena Jurevičienė Director of Management at Vilnius University Hospital Santaros klinikos Rokas Navickas Centre of Angiology and Cardiology, Vilnius Univeristy Hospital Santaros klinikos, a member of the Lithuanian Hypertension Association.
Front-line stakeholders	Lina Vencevičienė, MD coordinator of the physicians at Family medicine centre of Vilnius University Hospital Santaros klinikos., Vytautas Kasiulevičius Director of the Family medicine centre of Vilnius University Hospital Santaros klinikos. Assoc. prof. of Medical faculty of Vilnius University Family doctors at Vilnius University Hospital Santaros klinikos: Kazys Simanauskas (VUHSK), Dalia Vasiliūnienė (VUHSK), Vencevičienė Lina (VUHSK), Vytautas Kasiulevičius(VUHSK) Elena Jurevičienė, Director of Management at Vilnius University Hospital Santaros klinikos
Implementers	Vytautas Kasiulevičius(VUHSK), Lina Vencevičienė(VUHSK) Nomeda Minkevičienė(VUHSK), Aldona Kuporosova(VUHSK), Edita Licholip(VUHSK), Violeta Bičkauskienė(VUHSK), Eglė Vidūta(VUHSK) Laimis Dambrauskas(VUHSK), Kristina Švaikevičienė(VUHSK), Rokas Navickas(VUHSK) Kristina Švaikevičienė(VUHSK) Eglė Vidūta (VUHSK) social worker at Vilnius University Hospital Santaros klinikos
Patient representatives	Representative of patient organization

Scope

Item	Description
Problem/challenge	Patients with multimorbidity have complex health needs but due to the current traditional disease-oriented approach, they face a highly fragmented form of care. In Lithuania, primary care and specifically family physicians, have to navigate patients through healthcare system, however patient with chronic diseases often being sent from one specialist to another, leading to possible fragmentation of care. The delivery of the primary care for MM patients is not coordinated and is based on disease-specific guidelines. In a usual care setting patients often experience poor case coordination, and frequently don't have a reference care provider. The access to social and community resources are poor and the availability of these services is extremely variable. In addition, patients between 40 and 75 years of age with MM are heavy reimbursed medications users with a greater risk of polypharmacy. At the age of 65 and over, the prevalence of multimorbidity in the Lithuanian population was 42% and at the age of 85 it was above 62%. Even more, related results revealed more than 10% of the population already having at least two chronic conditions at the age of 45 and over. The main problem is that we don`t have data/information on patient's needs and expectations regarding their condition and barriers to care. Everything mentioned above causes more negative effects of multimorbidity such as mortality, higher number of hospitalizations and readmissions in a short period of time, increased or inappropriate use of healthcare services, decrease in quality of life, etc
General purpose of the intervention	General aims of the intervention are: to optimize treatment, maintenance and healthcare resources, to improve the quality of life, decrease the number of potentially avoidable hospitalizations and readmissions. Based on local experience and knowledge, at the end of implementation, we aim to determine country specific model version, fully adapted and specified for further local implementation.
Target population	Patients with multimorbidity, that are treated at Vilnius University Hospital Santaros Klinikos, Family Medicine Center and private family clinic "InMedica". The target population are heavy users of the healthcare resources between 40 and 75 years of age having more than one chronic condition.

Topic identification: Integrated Care Model Components implemented	Regular comprehensive assessment of patients • Multidisciplinary, coordinated team • Case manager • Individualized care plans • Training members of the multidisciplinary team • Developing a consultation system to consult professional experts • Providing options to improve self-management • Exchange of patient information • Involvement of social network

SWOT

Strengths	Weaknesses
Sustainability • Available national and local policies*. • Implementation is endorsed by local policy makers, decision makers and stakeholders • Multidisciplinary team of health care specialists is available. • GPs are going to participate. • Main stakeholders are identified • Psysical resources are available • Strong leadership and coordination by experts in health economics, outcomes and management of non-communicable diseases. **Organization** • Hospital administration supports the ICMM implementation. • VULSK provide all levels of care in all medical fields 24/7. • Patients with multimorbidity first of all come to GPs at primary care setting. • A multidisciplinary team is assigned with clear roles and responsibilities. • Lithuanian Bioethics Committee endorsed the implementation. **Empowerment** • GPs have all the rights to treat patients with multimorbidity. **Communication** • GPs and their nurses can give the information about MCM. **Monitoring & Evaluation** • Highly skilled researchers are going to coordinate the basics of the implementation, and to assess the medium outcomes of the intervention. • Online monitoring system is designed for the ICMM implementation.	**Sustainability** • National authorities are not going to participate • No additional funding for implementation • Multidisciplinary team specialists won`t be payed in addition. • Too many patients, too less GPs and lack of incentives for GPs • A case manager has no experience • Limited human resources **Organization** • GPs do not have enough time for multimorbid patients treatment. • A health - care information system for patients with multimorbidity is not available. • The healthcare professionals (nurses) are not trained to implement the ICMM • Currently, there is no specific guidelines for the management of MM patients. **Empowerment** • There is a lack of time resources assigned and no additional financing to threat multimorbid patient. **Communication** • There are no information materials for the patients about multimorbidity **Monitoring & Evaluation** • There is no guideline. • Health services quality and performance is not monitored. • Period too short to measure absolute outcomes.

Opportunities	Threats
Sustainability External sources of funding may be available through International Organizations. Training of healthcare professional may be available through CHRODIS PLUS partners. Organization The Lithuanian MoH may support ICMM integration. Social worker will collaborate with local authorities. Empowerment A multimorbidity care model was created to improve patients with multimorbidity health-care quality. Communication A strategy for ICMM integration at primary care setting at Vilnius University Hospital Santaros Klinikos, Family Medicine Center has been designed. Monitoring & Evaluation New recommendations may be established for multimorbidity, that may give the opportunity to monitor health services, to improve the quality of health-care.	Sustainability Limited allocation of resources for patients with multimorbidity from the National and Regional Level. Limited number of pantient in target population Local policies may be not up to date Organization Health and administrative data flows are not completely integrated.High personnel turnover. Lack of social resources. Lack of healthcare personnel with a wide IT knowledge. Empowerment The permission for Integration of Multimorbidity Care Model may be not given by the Lithuanian Bioethics Committee. Patients may not accept to participate in the pilot implementation. Communication Insufficient resources for collaboration with other primary care settings. Monitoring & Evaluation Depends on the outcomes of the ICMM results. Old population. Not enough time to measure health related outcomes.

*LT Health system law - https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.5905/vquxCJSFbC?positionInSearchResults=1&searchModelUUID=89ef1606-17d7-4e6f-b910-806fe58e02a6
*The Law on Patient's Rights and Compensation for Health Damage - https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.31932/DzPjFdpgSj?positionInSearchResults=0&searchModelUUID=89ef1606-17d7-4e6f-b910-806fe58e02a6
*Medical Practice law - https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.31926/lhUZFniqPM?positionInSearchResults=4&searchModelUUID=89ef1606-17d7-4e6f-b910-806fe58e02a6
*Law of the Republic of Lithuania on Health Care Institutions - https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.29546/cEiEIpEwLc?positionInSearchResults=2&searchModelUUID=89ef1606-17d7-4e6f-b910-806fe58e02a6
*Law of Republic of Lithuania on Public health supervision - https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.167900/LTzobmDAZV?positionInSearchResults=1&searchModelUUID=89ef1606-17d7-4e6f-b910-806fe58e02a6
*Law of Republic of Lithuania on Municipal health supervision - https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.463684/UshekyEAQN?positionInSearchResults=3&searchModelUUID=89ef1606-17d7-4e6f-b910-806fe58e02a6

Improvement areas

Improvement areas	Priority score (1-3)	Ranking
Professional's training needs assessed / Multidisciplinary team establishment/Training programs for team member	3	1
Guidelines on the management of multimorbidity	3	8
Patient's needs and expectations analysis regarding their condition and barriers to care	3	2
Training program for case-manager, who will intermediate between a patient and various members of the multidisciplinary team	3	3
Information material for the patients about multimorbidity (patient self-management)	2	6
Communication among healthcare professionals. Decision support system for healthcare professionals/ consultation system to be advised by professional experts	2	7
Individualized care plans	3	2
Regular comprehensive assessment of patients	2	5
Social sector and social worker active involvement in *Multidisciplinary, coordinated team*	3	4

Change package

Improvement area(s)	Objective(s)	Change Package Describe the activities	Person(s) involved /responsible	Timeline (months)	Key performance indicator(s)
Multidisciplinary team establishment	A multidisciplinary team aims at increasing efficiency and accessibility of care by providing coordinated multidisciplinary care both in terms of different levels of the healthcare profession (nurses, physicians, physiotherapists, social workers, etc.), and different disease specializations.	-Assess multiprofessional team training needs -Produce the guidelines for the multidisciplinary team. -Train the multiprofessional team to the use of the guidelines Multidisciplinary team establishment	Experts Front-line stakeholders Implementers	M14-M19	Focus group qualitative analysis Indicators of utilization of health resources: hospitalizations, hospitalizations by ambulatory care sensitive conditions, re-admissions in a given short period of time, visits to GP, to the emergency room, to specialists. -The number of unplaned visits, -The number and duration of hospitalizations, admissions to emergency room and avoidable hospitalizations in 12 months. Number of incompatible drugs combination (drug interaction rate) EQ-5D questionnaire PACIC questionnaire

Patient's needs and expectations analysis regarding their condition and barriers to care	Collect information on patient's needs and expectations regarding their condition and barriers to care	Collect information on patient's needs Analyse the findings Modify the action plan according to findings	Implementers	M14-M19	PACIC questionnaire EQ-5D questionaire
Training program for case-manager, who will intermediate between a patient and various members of the multidisciplinary team	A case manager will act as an individualized care plan coordinator who intermediates between a patient and various members of the multidisciplinary team.	Assess the training need Consult wih experts/WP partners and explore training alternatives Elaborate training program for case manager and other healthcare professionals, which should focus on the following themes: comprehensive assessment concepts, multimorbidity and its consequences, health outcomes, innovation technologies, implementation of individualized treatment/care plans and goal setting, working effectively as a team, training in the critical appraisal of knowledge and evidence based knowledge, patient-centeredness, patient	Implementers	M14-M19	Focus group qualitative analysis - Existence of a guidelines that describes the role of case manager: Y/N

		empowerment, and self-management -Train the case manager -Establish links with social sector			
Social sector and social worker active involvement in Multidisciplinary, coordinated team	Supporting access to community and social resources enables improvement of the patient's access to community resources, formal care, and patient associations, support groups, and psychosocial support, and supports access to such services.	Involve social worker in the MM patient care Elaborate action plan Encourage patients to increase health literacy and tailor health promotion and prevention strategies	Front-line stakeholders, social worker	M14-M30	PACIC questionnaire Utilization of health resources: hospitalizations, hospitalizations by ambulatory care sensitive conditions, re-admissions in a given short period of time, visits to GP, to the emergency room, to specialities.
Individualized care plans and regular comprehensive assessment of patients	Comprehensive assessment will be used to determine medical, psychological and functional capabilities of patients with multimorbidity in order to develop acoordinated and integrated care plan for multidisciplinary treatment and long-term follow-up of the patients. Individualized plans will be based on the comprehensive assessment by a multidisciplinary team, including a patient-centred approach that considers	Regular comprehensive assessment is done using standardized assessment tools where possible, along with a clinical interview. Assess the complexity of conditions including treatment burden, drug interactions, and disease patterns etc. Identify key aspects which will be used in any consequent care planning steps,	Front-line stakeholders	M14-M15	EQ-5D questionnaire PACIC questionnaire Utilization of health resources: hospitalizations, hospitalizations by ambulatory care sensitive conditions, re-admissions in a given short period of time, visits to GP, to the emergency room, to specialities. - % of patients with individualized care plan based on a comprehensive assessment.

	preferences of the patients, and prioritization of cross-disease, holistic approach.	Review and update individualized care plan during the regular subsequent assessments			-Number of visits to Primary Care team in 12 months per patient.
Information material for the patients about multimorbidity (patient self-management)	Options for patients to improve their self-management should be personalized and consistent with their individualized care plans.	Offer approaches to strengthen patients' self-management and self-efficacy, including explaining their diagnoses, diseases, and medical conditions, as well as providing information on medication use, and training patients to use medical devices, supportive aids, and health monitoring tools correctly (for example, blood pressure and glucose monitoring tools etc).	Implementers	M20-M30	EQ-5D questionnaire PACIC questionnaire
Communication among healthcare professionals.	A consultation system aims at providing decision support in situations where further clinical support or knowlegde is needed outside of the core team. Providing the multidisciplinary team with access to high competence in all cases that are particular	Regular communication between Multidisciplinary team members Regular internal meeting of VULSK team members Regular LIWG team meeting	Implementers	M20-M30	Focus group qualitative analysis - Number of consultations / 12 months.

	and delicate or when a sufficient expertise is not available will provide significant value. The aim is to increase accessibility to very specific professionals and specific knowledge.	Regular teleconferences with other LIWG from WP6 Consultation with experts and WP leader			
Guidelines on the management of multimorbidity	At the end of implementation, we aim to determine country specific model version.	Country specific model version, fully adapted and specified for further local implementation. New recommendations may be established for multimorbidity, that may give the opportunity to monitor health services and improve the quality of health-care.	LIWG members	M30 – M33	- Existence of a guidelines that describes the management of multimorbidity in Lithuania: Y/N

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