

D6.2 Report on Learning Session I

Baseline phase

WP 6: Service Selection

*ACT@Scale
Advancing Care Coordination and
Telehealth @ Scale*

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Short description of the Deliverable:

The work package 6 (WP6) of the Advancing Care Coordination and Telehealth deployment at Scale (ACT@Scale) project, which strives for obtaining commitment and support from interest groups related to care coordination and telehealth, intends also to apply a collaborative methodology (PDSA – Plan, Do, Study, Act) to improve performance of four key drivers of change (Stakeholder and Change Management, Service selection, Sustainability and business models, and Citizen empowerment).

This deliverable presents the results of the baseline phase from the programs that have selected service Selection as one of their driver to facilitate their scaling-up.

REVISION HISTORY

REVISION	DATE	COMMENTS	AUTHOR (NAME AND ORGANISATION)
Vo.1	18/10/2016	Includes contribution of Basque Country and Northern Ireland	Ane Fullaondo (Kronikgune)
v.02	21/11/2016	Include RSD paragraph and input from Catalonia	Ane Fullaondo (Kronikgune)
V1.0	23/11/2016	Executive summary and formatting	Ane Fullaondo (Kronikgune)

Executive Summary

The aim of ACT@Scale is to scale up good practices within a given region by implementing collaborative approaches. ACT@Scale methodology, based on Plan-Do-Study-Act (PDSA) cycles, applies multi-organizational structured collaborative quality improvement procedures and adapts them to scale up integrated care experiences.

The different phases of the collaborative methodology of ACT@Scale are:

1. Baseline phase
2. Learning cycle
3. Coaching cycle
4. Dissemination phase

This deliverable documents the information gathered during the baseline phase in those programs that have selected the service selection driver. This information is organized as a route map and follows the structure below:

- Selection of the driver to work on based on scientific evidence
- Set up the multidisciplinary team
- Identification of improvement areas
- Definition of collaborative objectives
- Development of specific interventions for changes that lead to scaling-up (“change package”)
- Definition of key performance indicators

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Introduction

This document presents the report on Learning session I of each programme which has chosen "Service Selection" as a driver to facilitate the up-scaling process. The reports describes the tasks performed during the baseline phase, mainly the distinct steps defined for the route maps: topic selection, creation of multidisciplinary team, identification of improvement areas, set up of objectives, definition of change interventions and building of the evaluation framework.

The programmes that have selected "Service Selection" driver are:

- Integrated care pathway for multimorbid patients (Basque Country)
- Telemonitoring in CHF (Basque Country)
- Diabetes monitoring program (Northern Ireland)
- Collaborative self-management services to promote physical activity (AISBE-PA) (Catalonia)
- Community-based Collaborative Management of Complex Chronic Patients (AISBE-CCP) (Catalonia)
- Integrated care for subacute and frail older adults (PSPV) (Catalonia)

Collaborative Methodology: Baseline Regional Report (Basque Country) - Integrated care pathway for multimorbid patients

The first phase of the collaborative methodology in ACT@Scale project is the baseline phase. The below template documents the information collected during the session.

1. Topic selection

The drivers to facilitate the scaling-up of the “Integrated care for multimorbid patients” program chosen are:

- A. Stakeholder management and change management
- B. Optimization of recruitment, service selection and service dynamic adaptation
- C. Citizen empowerment

2. Multidisciplinary team (number and profile)

The multidisciplinary team is composed by different members, the functions and roles are:

- *Organizer*: three members of the methodological staff with skills in leading team dynamics
- *Experts*: six internists with extended experience in service managing and implementing new organizational models, and two implementation experts
- *Decision makers*: twelve members of distinct managerial team, one representative of the Healthcare Directorate of Osakidetza
- *Project Manager/Representatives of organizations*: one project manager with the general overview of the project and nine representatives of fourteen organizations
- *Implementers/Representatives of organizations*: nine representatives of fourteen organizations
- *Total participants*: 27

* Some participants have multiple roles and are counted in different categories.

3. Improvement areas

The multidisciplinary working team has defined several improvement areas that include resistance to change, labor instability, lack of time of professionals, weak training of professionals, lack of leadership, low participation of patients and caregivers etc.

The improvement areas in which the efforts will be put on during the PDSA cycles are:

- Lack of clinical view in the population-based stratification of patients (inclusion/exclusion criteria of patients and prognosis variables)
- Non-dynamic population-based stratification which does not respond to practice's needs
- Poor professionals' credibility on the tool
- Existence of different disease-based care plans for a given patient created by healthcare professionals unilaterally.
- Discontinuity in the care plan execution due to poor coherence between the organization's capacity and the services offered
- Not all stakeholders are involved in the creation of the care plan or have access to it
- Fragmented care, significant gap between social and health care
- Not sufficient clarity in the definition of the roles of the stakeholders involved in the care pathway

4. Objectives

Agree and describe the progress you want to achieve on each improvement area.

- Consider the clinical perspective of healthcare professionals in the population-based stratification
- Simplify and specify the criteria used for the population-based stratification
- Improve healthcare professionals' understanding of the ground behind the stratification
- Ensure the existence of an updated reconciled and personalized care plan agreed by all stakeholders (including patients and caregivers, and social sector) for each multimorbid patient
- Make the care plan visible to all stakeholders
- Align the resources and capacity of each organization with the organizational model to be deployed

5. Change package (interventions)

The interventions that will be carried out are summarized below. They will be further refined once the first PDSA cycle starts.

1. Prepare, plan and provide training sessions (online or face-to-face) for professionals to explain the theoretical basis of the stratification, its methodology and its application in the Basque Health System
2. Include revised clinical variables and experience/practice-based validation into the population-based stratification
3. Update the population-based stratification in a 6-month basis
4. Nominate a care plan manager responsible for reconciling and personalizing the care plans according to the inputs received from both the professionals providing care to a given patient and the patient/caregiver.
5. Define and set up a procedure to regularly review the reconciled care plan and adapt it to the patient's changing needs
6. Make the reconciled and personalized care plans accessible in the Electronic Healthcare Record for all healthcare professionals ensuring its execution in a 24x7 basis
7. Describe the roles (social and health care) required in the integrated care pathway for multimorbid patients and define the specific actors who will performed these roles in each organization (tailoring of the program)

6. Key Performance Indicators

The program will use WP4 indicators in the PDSA cycles: Up-scaling, cluster and process indicators.

UP-SCALING INDICATORS

Data input	Topic	Type	Measure	Target for surveys
Scaling-up: Experience of Care	Healthcare	NPS question		Patients
	Consumer Assessment			
	Psycho-social factors	PAM included in MAY survey		Patients
Scaling-up: Health of a population	Coverage	Databases Population	Population size Stratified population	-

			Target population Population served Population diagnosed
	Coverage	Databases Individual	Diagnosis Status in the program Reasons for out
	Disease burden:	Databases Population	Incidence Prevalence
Scaling-up: Per capita costs	Total cost	Databases Population	-
	- Utilisation	Databases	-
	- Unit cost	Individual	

CLUSTER SPECIFIC INDICATORS

Cluster	TYPE	Measure	Note
Multimorbid	ADJ	Charlson Comorbidity Index	CCI score
	ADJ	Comorbidity Polypharmacy Index	CPS score
	HOM	Total cholesterol	mmol/l
	HOM	LDL cholesterol	mmol/l
	COM	PC: home visit	Cost + utilization
	COM	PC: GP visit	Cost + utilization
	COM	PC: nurse visit	Cost + utilization
	COM	SC: ED visit	Cost + utilization
	COM	SC: specialist visit	Cost + utilization
	COM	SC: admissions	Cost + utilization
	COM	SC: readmissions (30)	Cost + utilization
	COM	SC: hospitalization	Cost + utilization
	COM	SC: outpatient visit	Cost + utilization
	COM	CC: community care referrals	Cost + utilization
	COM	CC: home visit	Cost + utilization

PROCESS INDICATORS

Description, identification and selection of patients

1. Is there a formal risk stratification approach used to formal targeting, identification and selection of patients?
 - 1) No

- 2) Individual level
 - 3) Population level
 - 4) Both, individual and population level
2. If there is a risk stratification approach, to which extent is used to formal targeting, identification and selection of patients in real practice?
 - 1) It is defined but not used (not yet implemented)
 - 2) Used to some extent (lowly implemented)
 - 3) Used extensively (highly implemented)
 - 4) Always used (fully implemented)
 3. If there is a risk stratification approach used to formal targeting, identification and selection of patients, on which criteria is based?
 - 1) Clinical criteria: Based on the clinician training, knowledge, instinct and experience.
 - 2) 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).
 - 3) 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.
 - 4) Mixed method: 3 and 1
 4. If there is a Risk Stratification tool used, how stratification information results can be accessed and modified by healthcare professionals?
 - 1) Healthcare professionals are informed of the final list of their stratified patients
 - 2) Healthcare professionals can identify individual stratified patients on their health records.
 - 3) Healthcare professionals can identify individual stratified patients on their health records and suggest changes.
 - 4) Healthcare professionals can identify individual stratified patients on their health records and can edit and modify the stratified patients.
 5. Inclusion into the program (case selection): Ratio of identified population finally included in the program.
 - 1) <25%
 - 2) 25-50%
 - 3) 51-75%
 - 4) >75%

Services responding to patients needs

6. There is an individualized Patient Care Plan?

- 1) No, the program is the same for all patients regardless of their conditions.
- 2) It may be some specific clinical decisions according to patients evolution but not a formal care plan.
- 3) There is an individualized care plan but it does not change according to the evolution of the patient.
- 4) There is an individualized care plan that dynamically changes according to the evolution of the patient.

7. If there is a care plan (answers 2,3 and 4 in previous question), which variables does it take into account to match specific interventions to the patient's needs?

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

8. If there is a care plan, please select which specific service type can be activated (integrated care plan maturity):

- 1) Usual care reactive to patient demand, including full range of patient care options that a clinician could choose to provide or offer to meet an individual patient's needs, such as medication reviews, referral to specialist, social care, rehabilitation and community nursing services (episode centered)
- 1) Organized care: includes (1), ensuring coordination over time between primary and specialist care, for diagnostics and for social support, as well as ensuring timely review (Process).
- 2) Proactive plan care, includes (2) with based on risk stratification patient selection, according to patient-level clinical requirements, including Care management if required, self-management programs and follow-up (Care plan)
- 3) Proactive shared care planning –includes (3) with goals agreed with patient and stakeholders involved, ensuring a patient-centered care plan, including changes when required (Personalized care plan)

9. If there is a care plan, which is frequency of the planned interventions revisions to match patient changing needs (service dynamic adaptation)?

- 1) >12 months
- 2) 1to 12 months

- 3) <1 month
- 4) Ongoing (continuous)

10. If there is a risk stratification approach in service dynamic adaptation, which is the adaptive case management does it allow?

- 1) Just predict future events.
- 2) Besides (1) guides the type of interventions offered to the patient.
- 3) Besides (2), define the intensity of intervention offered to the patient.
- 4) Besides (3), establish an individualized care plan.

11. The adaptive care plan includes (tick all that apply):

- a) Patient care well-defined Goals
- b) Pharmacological interventions
- c) Immunization
- d) Nursing care
- e) Rehabilitation activities
- f) Medical Devices and appliances
- g) Referral to specialist(s)
- h) Surgical procedures
- i) Health Promotion activities (exercise, nutrition, other habits...)
- j) Health coaching – health literacy, patient activation, adherence to care plans, and self-management skill building.
- k) Social care
- l) Community resources
- m) Clinical assessments and metrics (physical exams, Lab Tests, diagnostic procedures)
- n) Planned encounters and follow up
- o) Logistic support
- p) Others: _____

12. Level of patient / caregiver involvement in the care plan.

- 1) Does not include results of patient assessments
- 2) Includes results of patients assessments, but not self-management goals
- 3) Includes results of patient's assessments and self-management goals agreed by healthcare professionals and patient.
- 4) Includes results of patient's assessments, self-management goals agreed by healthcare professionals and patient, and patient follow-up
- a) healthcare and social-care

On-boarding the required professionals and services

13. Degree of healthcare tiers accessibility to the patient care plan?

- 1) Primary Care Clinician/nurse
- 2) Primary Care Clinician + nurse
- 3) Multi-level clinicians (Primary Care and hospital)
- 4) Multi-level clinicians + social and other resources

14. Please indicate the number of healthcare professionals involved in the program:

- Primary Care Clinicians: _____
- Community Nurses: _____
- Specialist/Consultants: _____
- Hospital Nurses: _____
- Social workers: _____
- Managers: _____
- Other: _____

15. Awareness amongst staff evaluated regularly and findings acted upon appropriately

- 1) Never evaluated
- 2) Evaluated but no action taken
- 3) Evaluated and findings acted upon sporadically
- 4) Evaluated regularly and findings acted upon appropriately

16. Proportion of healthcare professionals involved that has been formally trained in case identification, case evaluation, and case selection?

- 1) <25%
- 2) 25-50%
- 3) 51-75%
- 4) >75%

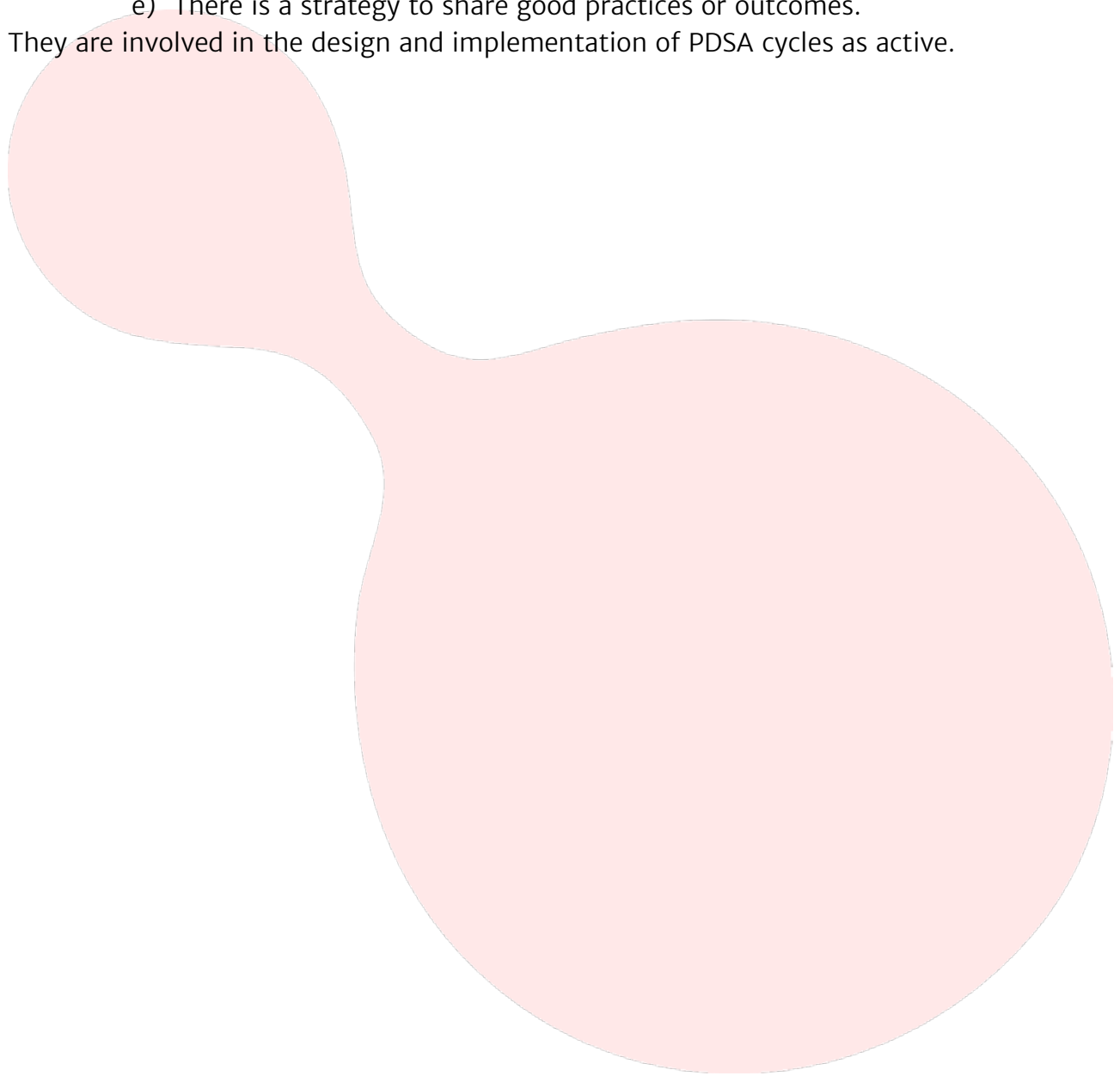
17. Proportion of healthcare professionals involved that has been formally trained in care plan formulation, evaluation, follow-up and adaptation?

- 1) <25%
- 2) 25-50%
- 3) 51-75%
- 4) >75%

18. Healthcare professionals influence the process of change (tick all that apply):

- a) Can modify the selected stratified patients
- b) Can choose a wide range of patient care options to meet patients' needs
- c) There are formal participation mechanisms to develop or change the intervention/program
- d) They are involved in training or supporting their colleagues
- e) There is a strategy to share good practices or outcomes.

They are involved in the design and implementation of PDSA cycles as active.



Collaborative Methodology: Baseline Regional Report (Basque Country) - Telemonitoring in CHF

The first phase of the collaborative methodology in ACT@Scale project is the baseline phase. The below template documents the information collected during the session.

1. Topic selection

The drivers to facilitate the scale-up chosen by the "telemonitoring in congestive heart failure" program are:

- A. Stakeholder management and change management
- B. **Optimization of recruitment, service selection and service dynamic adaptation**
- C. Citizen empowerment

2. Multidisciplinary team (number and profile)

The multidisciplinary team is composed by different members, the functions and roles are:

- *Organizer*: two members of the methodological staff with skills in leading team dynamics
- *Experts*: one cardiologist with extended experience in service managing and different monitoring initiatives (telemonitoring, phone-based follow-up), and one implementation expert
- *Decision makers*: three representatives of the Healthcare Directorate of Osakidetza
- *Project Manager/Representatives of organizations*: one project manager with the general overview of the project and two representatives of distinct organizations (integrated care organization and eHealth Centre)
- *Implementers/Representatives of organizations*: two representatives of distinct organizations (one integrated care organization and eHealth Centre)
- *Total participants*: 6 participants

* Some participants have multiple roles and are counted in different categories.

3. Improvement areas

The multidisciplinary working team has defined several improvement areas that include weak communication between professionals, lack of leadership, poor capacity to redefine care pathways, low participation of patients and caregivers etc.

The improvement areas in which the efforts will be put on during the PDSA cycles are:

- Clinical variables (including mental health) as well as social aspects are not considered in the stratification
- Output of the population-based stratification is not updated as frequent as needed
- Care plans created by different professionals are not shared even not reconciled and patient's and caregiver's view is not included
- Monitoring services are not adapted to patients' and caregivers' capacities and disease's phase

4. Objectives

- Consider more clinical variables as well as social features into the stratification and align the changing features of the patients with the stratification output
- Perform a more comprehensive assessment of the patient according to his/her health, social and mental status and share this information among professionals of different care levels and sectors
- Create a reconciled care plan agreed by all stakeholders
- Provide patient and/or caregivers with a monitoring service adapted to his/her capacities and disease phase

5. Change package (interventions)

The interventions that will be carried out are summarized below. They will be further refined once the first PDSA cycle starts.

1. Define the most relevant clinical variables as well as social features and include them in stratification
2. Plan, program scripts and run the stratification's update in a 6-month basis
3. Integrate the patient's health, social and mental health information in the Electronic health Record
4. Make available the resources required (technological tools, clinical guidelines, training) and create reconciled and personalized care plans (including patient's and caregiver's perspectives) available for all stakeholders
5. Define and agree on the inclusion criteria to provide patient and/or caregivers with the monitoring service (telemonitoring, Personal Health Folder, phone-based follow-up) which best fits his/her capacities and disease phase

6. Key Performance Indicators

List the scaling-up, program and process (drivers) indicators that will be used in the PDSA cycles. Used WP4 indicators as a reference.

UP-SCALING INDICATORS

Data input	Topic	Type	Measure	Target for surveys
Scaling-up: Experience of Care	Healthcare Consumer Assessment	NPS question		Patients
	Psycho-social factors	PAM included in MAY survey		Patients
Scaling-up: Health of a population	Coverage	Databases Population	Population size Stratified population Target population Population served Population diagnosed	-
	Coverage	Databases Individual	Diagnosis Status in the program Reasons for out	-

	Disease burden:	Databases Population	Incidence Prevalence	-
Scaling-up: Per capita costs	Total cost	Databases Population		-
	- Utilisation - Unit cost	Databases Individual		-

CLUSTER SPECIFIC INDICATORS

Cluster	TYPE	Measure	Note
Multimorbid	ADJ	Charlson Comorbidity Index	CCI score
	ADJ	Comorbidity Index Polypharmacy	CPS score
	HOM	Total cholesterol	mmol/l
	HOM	LDL cholesterol	mmol/l
	COM	PC: home visit	Cost + utilization
	COM	PC: GP visit	Cost + utilization
	COM	PC: nurse visit	Cost + utilization
	COM	SC: ED visit	Cost + utilization
	COM	SC: specialist visit	Cost + utilization
	COM	SC: admissions	Cost + utilization
	COM	SC: readmissions (30)	Cost + utilization
	COM	SC: hospitalization	Cost + utilization
	COM	SC: outpatient visit	Cost + utilization
	COM	CC: community care referrals	Cost + utilization
	COM	CC: home visit	Cost + utilization

PROCESS INDICATORS

Description, identification and selection of patients

4. Is there a formal risk stratification approach used to formal targeting, identification and selection of patients?
 - 5) No
 - 6) Individual level
 - 7) Population level
 - 8) Both, individual and population level

5. If there is a risk stratification approach, to which extent is used to formal targeting, identification and selection of patients in real practice?
 - 5) It is defined but not used (not yet implemented)
 - 6) Used to some extent (lowly implemented)
 - 7) Used extensively (highly implemented)
 - 8) Always used (fully implemented)

6. If there is a risk stratification approach used to formal targeting, identification and selection of patients, on which criteria is based?
 - 5) Clinical criteria: Based on the clinician training, knowledge, instinct and experience.
 - 6) 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).
 - 7) 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.
 - 8) Mixed method: 3 and 1

4. If there is a Risk Stratification tool used, how stratification information results can be accessed and modified by healthcare professionals?
 - 5) Healthcare professionals are informed of the final list of their stratified patients
 - 6) Healthcare professionals can identify individual stratified patients on their health records.
 - 7) Healthcare professionals can identify individual stratified patients on their health records and suggest changes.
 - 8) Healthcare professionals can identify individual stratified patients on their health records and can edit and modify the stratified patients.

6. Inclusion into the program (case selection): Ratio of identified population finally included in the program.
 - 5) <25%
 - 6) 25-50%
 - 7) 51-75%
 - 8) >75%

Services responding to patients needs

6. There is an individualized Patient Care Plan?

- 5) No, the program is the same for all patients regardless of their conditions.
- 6) It may be some specific clinical decisions according to patients evolution but not a formal care plan.
- 7) There is an individualized care plan but it does not change according to the evolution of the patient.
- 8) There is an individualized care plan that dynamically changes according to the evolution of the patient.

7. If there is a care plan (answers 2,3 and 4 in previous question), which variables does it take into account to match specific interventions to the patient's needs?

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

8. If there is a care plan, please select which specific service type can be activated (integrated care plan maturity):

- 2) Usual care reactive to patient demand, including full range of patient care options that a clinician could choose to provide or offer to meet an individual patient's needs, such as medication reviews, referral to specialist, social care, rehabilitation and community nursing services (episode centered)
- 4) Organized care: includes (1), ensuring coordination over time between primary and specialist care, for diagnostics and for social support, as well as ensuring timely review (Process).
- 5) Proactive plan care, includes (2) with based on risk stratification patient selection, according to patient-level clinical requirements, including Care management if required, self-management programs and follow-up (Care plan)
- 6) Proactive shared care planning –includes (3) with goals agreed with patient and stakeholders involved, ensuring a patient-centered care plan, including changes when required (Personalized care plan)

9. If there is a care plan, which is frequency of the planned interventions revisions to match patient changing needs (service dynamic adaptation)?

- 5) >12 months
- 6) 1to 12 months

- 7) <1 month
- 8) Ongoing (continuous)

19. If there is a risk stratification approach in service dynamic adaptation, which is the adaptive case management does it allow?

- 5) Just predict future events.
- 6) Besides (1) guides the type of interventions offered to the patient.
- 7) Besides (2), define the intensity of intervention offered to the patient.
- 8) Besides (3), establish an individualized care plan.

20. The adaptive care plan includes (tick all that apply):

- q) Patient care well-defined Goals
- r) Pharmacological interventions
- s) Immunization
- t) Nursing care
- u) Rehabilitation activities
- v) Medical Devices and appliances
- w) Referral to specialist(s)
- x) Surgical procedures
- y) Health Promotion activities (exercise, nutrition, other habits...)
- z) Health coaching – health literacy, patient activation, adherence to care plans, and self-management skill building.
- aa) Social care
- bb) Community resources
- cc) Clinical assessments and metrics (physical exams, Lab Tests, diagnostic procedures)
- dd) Planned encounters and follow up
- ee) Logistic support
- ff) Others: _____

21. Level of patient / caregiver involvement in the care plan.

- 5) Does not include results of patient assessments
- 6) Includes results of patients assessments, but not self-management goals
- 7) Includes results of patient's assessments and self-management goals agreed by healthcare professionals and patient.
- 8) Includes results of patient's assessments, self-management goals agreed by healthcare professionals and patient, and patient follow-up
- b) healthcare and social-care

On-boarding the required professionals and services

22. Degree of healthcare tiers accessibility to the patient care plan?

- 5) Primary Care Clinician/nurse
- 6) Primary Care Clinician + nurse
- 7) Multi-level clinicians (Primary Care and hospital)
- 8) Multi-level clinicians + social and other resources

23. Please indicate the number of healthcare professionals involved in the program:

- Primary Care Clinicians: _____
- Community Nurses: _____
- Specialist/Consultants: _____
- Hospital Nurses: _____
- Social workers: _____
- Managers: _____
- Other: _____

24. Awareness amongst staff evaluated regularly and findings acted upon appropriately

- 5) Never evaluated
- 6) Evaluated but no action taken
- 7) Evaluated and findings acted upon sporadically
- 8) Evaluated regularly and findings acted upon appropriately

25. Proportion of healthcare professionals involved that has been formally trained in case identification, case evaluation, and case selection?

- 5) <25%
- 6) 25-50%
- 7) 51-75%
- 8) >75%

26. Proportion of healthcare professionals involved that has been formally trained in care plan formulation, evaluation, follow-up and adaptation?

- 5) <25%
- 6) 25-50%
- 7) 51-75%
- 8) >75%

27. Healthcare professionals influence the process of change (tick all that apply):

- f) Can modify the selected stratified patients
- g) Can choose a wide range of patient care options to meet patients' needs
- h) There are formal participation mechanisms to develop or change the intervention/program
- i) They are involved in training or supporting their colleagues
- j) There is a strategy to share good practices or outcomes.

They are involved in the design and implementation of PDSA cycles as active.



Collaborative Methodology: Baseline Regional Report (Northern Ireland) – Diabetes monitoring program

The first phase of the collaborative methodology in ACT@Scale project is the baseline phase. The below template documents the information collected during the session.

1. Topic selection

The drivers to facilitate the scale-up chosen by the "Diabetes telemonitoring program" program are:

- A. Optimization of recruitment, service selection and service dynamic adaptation
- B. Citizen empowerment

2. Multidisciplinary team (number and profile)

The multidisciplinary team is composed by different members, the functions and roles are:

- Public Health Agency staff involved in project management
- Health and Social care staff (diabetes nurse specialist, consultant diabetologists) with experience in service managing and implementing new organizational models
- Telemonitoring Service Managers

3. Improvement areas

- "Formal" risk stratification methodologies are not used within the service
- Clinical variables (including mental health) as well as social aspects are not considered in current patient selection
- Output of any population-based stratification is not utilized regionally

- Care plans created by different professionals are not shared or not reconciled and patient's and caregiver's view is not included
 - Monitoring services are not adapted to patients' and caregivers' capacities and disease phase

4. Objectives

The following objectives on each improvement area have been identified by the group as those they wish to progress through the PDSA learning cycles.

- Consider more clinical variables as well as social features into the stratification and align the changing features of the patients with the stratification output
- Perform a more comprehensive assessment of the patient according to his/her health, social and mental status and share this information among professionals of different care levels and sectors
- Consider opportunities of using risk stratification to prevent secondary complications for people with diabetes
- Provide patient and/or caregivers with a monitoring service adapted to his/her capacities and disease phase through a patient portal
- Consider recognition of, and services for, at risk or vulnerable groups; and encouraging innovation in care for people living with diabetes

5. Change package (interventions)

1. Consider the use of formal stratification methodology to identify and optimize patient recruitment
2. Align patient features with the stratification output
3. Provide patient and/or caregivers with a monitoring service adapted to his/her capacities and disease phase through development of telemonitoring patient portal

6. Key Performance Indicators

UP-SCALING INDICATORS

Data input	Topic	Type	Measure	Target for surveys
Scaling-up: Experience of Care	Healthcare Consumer Assessment	NPS question		Patients
	Psycho-social factors	PAM included in MAY survey		Patients
Scaling-up: Health of a population	Coverage	Databases Population	Population size Stratified population Target population Population served Population diagnosed	-
	Coverage	Databases Individual	Diagnosis Status in the program Reasons for out	-
	Disease burden:	Databases Population	Incidence Prevalence	-
Scaling-up: Per capita costs	Total cost	Databases Population		-
	- Utilisation	Databases		-
	- Unit cost	Individual		

CLUSTER SPECIFIC INDICATORS

Cluster outcomes are outcomes that are specific to a cluster, i.e. a group of similar programs and are not captured by the general scaling outcomes.

Cluster	TYPE	Measure	Note
Diabetes ^{[1][2]}	HOM	HbA _{1c}	% as index for metabolic control
	HOM	Body mass index (BMI)	kg/m ²
	HOM	Blood pressure	mmHg
	HOM	Blood glucose	mmol/l
	HOM	Total cholesterol	mmol/l
	HOM	LDL cholesterol	mmol/l

^[1] <http://intqhc.oxfordjournals.org/content/15/4/301>

^[2] <http://care.diabetesjournals.org/content/27/2/398>

PROCESS INDICATORS

Description, identification and selection of patients

7. Is there a formal risk stratification approach used to formal targeting, identification and selection of patients?
 - 9) No
 - 10) Individual level
 - 11) Population level
 - 12) Both, individual and population level

8. If there is a risk stratification approach, to which extent is used to formal targeting, identification and selection of patients in real practice?
 - 9) It is defined but not used (not yet implemented)
 - 10) Used to some extent (lowly implemented)
 - 11) Used extensively (highly implemented)
 - 12) Always used (fully implemented)

9. If there is a risk stratification approach used to formal targeting, identification and selection of patients, on which criteria is based?
 - 9) Clinical criteria: Based on the clinician training, knowledge, instinct and experience.
 - 10) 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).
 - 11) 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.
 - 12) Mixed method: 3 and 1

4. If there is a Risk Stratification tool used, how stratification information results can be accessed and modified by healthcare professionals?
 - 9) Healthcare professionals are informed of the final list of their stratified patients
 - 10) Healthcare professionals can identify individual stratified patients on their health records.
 - 11) Healthcare professionals can identify individual stratified patients on their health records and suggest changes.

12) Healthcare professionals can identify individual stratified patients on their health records and can edit and modify the stratified patients.

7. Inclusion into the program (case selection): Ratio of identified population finally included in the program.

- 9) <25%
- 10) 25-50%
- 11) 51-75%
- 12) >75%

Services responding to patients needs

6. There is an individualized Patient Care Plan?

- 9) No, the program is the same for all patients regardless of their conditions.
- 10) It may be some specific clinical decisions according to patients evolution but not a formal care plan.
- 11) There is an individualized care plan but it does not change according to the evolution of the patient.
- 12) There is an individualized care plan that dynamically changes according to the evolution of the patient.

7. If there is a care plan (answers 2,3 and 4 in previous question), which variables does it take into account to match specific interventions to the patient's needs?

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

8. If there is a care plan, please select which specific service type can be activated (integrated care plan maturity):

- 3) Usual care reactive to patient demand, including full range of patient care options that a clinician could choose to provide or offer to meet an individual patient's needs, such as medication reviews, referral to specialist, social care, rehabilitation and community nursing services (episode centered)
- 7) Organized care: includes (1), ensuring coordination over time between primary and specialist care, for diagnostics and for social support, as well as ensuring timely review (Process).

- 8) Proactive plan care, includes (2) with based on risk stratification patient selection, according to patient-level clinical requirements, including Care management if required, self-management programs and follow-up (Care plan)
- 9) Proactive shared care planning –includes (3) with goals agreed with patient and stakeholders involved, ensuring a patient-centered care plan, including changes when required (Personalized care plan)

9. If there is a care plan, which is frequency of the planned interventions revisions to match patient changing needs (service dynamic adaptation)?

- 9) >12 months
- 10) 1to 12 months
- 11) <1 month
- 12) Ongoing (continuous)

28. If there is a risk stratification approach in service dynamic adaptation, which is the adaptive case management does it allow?

- 9) Just predict future events.
- 10) Besides (1) guides the type of interventions offered to the patient.
- 11) Besides (2), define the intensity of intervention offered to the patient.
- 12) Besides (3), establish an individualized care plan.

29. The adaptive care plan includes (tick all that apply):

- gg) Patient care well-defined Goals
- hh) Pharmacological interventions
- ii) Immunization
- jj) Nursing care
- kk) Rehabilitation activities
- ll) Medical Devices and appliances
- mm) Referral to specialist(s)
- nn) Surgical procedures
- oo) Health Promotion activities (exercise, nutrition, other habits...)
- pp) Health coaching –health literacy, patient activation, adherence to care plans, and self-management skill building.
- qq) Social care
- rr) Community resources
- ss) Clinical assessments and metrics (physical exams, Lab Tests, diagnostic procedures)
- tt) Planned encounters and follow up
- uu) Logistic support

vv) Others: _____

30. Level of patient / caregiver involvement in the care plan.

- 9) Does not include results of patient assessments
- 10) Includes results of patients assessments, but not self-management goals
- 11) Includes results of patient's assessments and self-management goals agreed by healthcare professionals and patient.
- 12) Includes results of patient's assessments, self-management goals agreed by healthcare professionals and patient, and patient follow-up
- c) healthcare and social-care

On-boarding the required professionals and services

31. Degree of healthcare tiers accessibility to the patient care plan?

- 9) Primary Care Clinician/nurse
- 10) Primary Care Clinician + nurse
- 11) Multi-level clinicians (Primary Care and hospital)
- 12) Multi-level clinicians + social and other resources

32. Please indicate the number of healthcare professionals involved in the program:

- Primary Care Clinicians: _____
- Community Nurses: _____
- Specialist/Consultants: _____
- Hospital Nurses: _____
- Social workers: _____
- Managers: _____
- Other: _____

33. Awareness amongst staff evaluated regularly and findings acted upon appropriately

- 9) Never evaluated
- 10) Evaluated but no action taken
- 11) Evaluated and findings acted upon sporadically
- 12) Evaluated regularly and findings acted upon appropriately

34. Proportion of healthcare professionals involved that has been formally trained in case identification, case evaluation, and case selection?

- 9) <25%

- 10) 25-50%
- 11) 51-75%
- 12) >75%

35. Proportion of healthcare professionals involved that has been formally trained in care plan formulation, evaluation, follow-up and adaptation?

- 9) <25%
- 10) 25-50%
- 11) 51-75%
- 12) >75%

36. Healthcare professionals influence the process of change (tick all that apply):

- k) Can modify the selected stratified patients
- l) Can choose a wide range of patient care options to meet patients' needs
- m) There are formal participation mechanisms to develop or change the intervention/program
- n) They are involved in training or supporting their colleagues
- o) There is a strategy to share good practices or outcomes.
- p) They are involved in the design and implementation of PDSA cycles as active.

Collaborative Methodology: Baseline Regional Report (Catalonia)- Collaborative self-management services to promote physical activity (AISBE-PA) (CAT-CHRON LS)

The first phase of the collaborative methodology in ACT@Scale project is that of the baseline. Below template to document the information to be gathered.

1. Topic selection

The drivers to facilitate the scaling-up of the “Collaborative self-management services to promote physical activity (AISBE-PA) (CAT-CHRON LS) program chosen are:

A. Optimization of recruitment, service selection and service dynamic adaptation

B. Sustainability and business case

In a second step (Spring 2017), we might joint D. Citizen empowerment. The current report only includes drivers B and C.

2. Multidisciplinary team (number and profile)

The current multidisciplinary team works in full alignment with the different AISBE committees addressing the organizational change between specialized & community-based care in the healthcare sector of Barcelona-Esquerri. Main characteristics of the active programs are reported in the references below. Moreover, an updated description of the CCP program has been updated in the Thick Description of the SELFIE project (<http://www.selfie2020.eu/selfie-project/>) about to be published in the project website.

- Font D. Et al (2016). *Integrated Health Care Barcelona Esquerri (Ais-Be): A Global View of Organisational Development, Re-Engineering of Processes and Improvement of the Information Systems. The Role of the Tertiary University Hospital in the Transformation. International Journal of Integrated Care. 2016;16(2):8.*

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- Hernandez C (2015). *Integrated care services: lessons learned from the Deployment of the NEXES project*. *International Journal of Integrated Care*, Jan–Mar; 15: e006.
- Hernandez C, et al. (2015). *Assessment of health status and program performance in patients on long-term oxygen therapy*. *RESPIRATORY MEDICINE*. JANUARY 2015. DOI: 10.1016/j.rmed.2015.01.005

For the period May to December 2016, the composition and roles of the multidisciplinary team are described below. However, this multidisciplinary team will be expanded after January 2017 within the frame of the NEXTCARE program (www.nextcarecat.cat) briefly described below. The plan is to enrich the team with additional managers, health professionals, social workers and patients.

Since the early days (2005), the AISBE program has been looking for convergence between deployment of mainstream integrated care services and development of an ecosystem of innovation. Recently, such a convergence has been formulated through the NEXTCARE (Innovation in Integrated Care Services for Chronic Patients), a RIS3 (Research and Innovation Strategies for Smart Specializations) initiative (2016–2020). NEXTCARE, launched in November 2016, addresses five actions that encompass the main challenges encountered during the deployment of integrated care. Action 1 deals with Health Risk Assessment and Stratification. Action 2 aims at promoting healthy lifestyles with focus on physical activity. Action 3 deploys community-based management of complex chronic patients (CCP). Action 4 deals with regional deployment of transfer of diagnostic testing to primary care focusing on forced spirometry as a use case. Finally, Action 5 promotes interoperability between healthcare, informal care and biomedical research conforming the so-called Digital Health Framework, as a technological facilitator supporting collaborative and adaptive case management (ACM).

It is of note that the current AISBE-CCP program will be focused on Action 3 of NEXTECARE. That is, community-based management of complex chronic patients (CCP).

The multidisciplinary team is composed by different members, the functions and roles are:

- *Organizer*: Two members with skills in leading team dynamics
- *Clinical experts*: Six healthcare professionals with expertise in integrated care
- *Technology experts*: Three professionals with expertise in information and communication technologies (ICT)
- *Decision makers*: One decision maker representative of the Healthcare Directorate of AISBE
- *Project Manager*: One project manager of the CCP program
- *Total participants*: 13

As indicated above, the multidisciplinary group should be expanded by the end of January 2017.

3. Improvement areas

The improvement areas selected within the driver are:

- Poor clinical risk assessment without considering the population-based stratification of patients
- Arbitrary criteria currently used for clinical risk assessment and stratification, not based on computational predictive models properly evaluated on a prospective basis.
- Static risk assessment and stratification not taking into consideration dynamic changes of the patients.
- Risk assessment and stratification exclusively based on clinical criteria.
- Insufficient implementation of patient (case) management based on clinical process definition. Formal definition of flexible (adaptive) service workflows is needed.
- There is a clear need for further refinement of some mainstream integrated care services (i.e. home hospitalization, integration between specialized & community-based services, etc...) in order to enhance bridging with community-based services.
- There is need for convergence of ICT-supporting tools used in several ongoing mainstream services with an integrated care approach (i.e. AIDS-HIV, tele-dermatology, home hospitalization, etc...).
- Existing ICT-supporting health information exchange among healthcare providers is insufficient to facilitate collaborative work among health care professionals across healthcare tiers.
- Existing ICT-supporting tools are insufficient to foster patient empowerment of self-management, as well as for integration of informal care information (i.e. social support needs) into the clinical decision making process.

4. Objectives

Agree and describe the progress you want to achieve on each improvement area.

- **Enhanced clinical risk assessment and stratification**
 - Evaluation of the potential of the population-based health risk assessment tool in Catalunya (GMA, Adjusted Morbidity Groups) to enhance clinical risk prediction.
 - Generation and evaluation of dynamic risk predictive modelling for stratification of patients included in the pre-habilitation program.
- **Service refinement**
 - To expand and refine the current pre-habilitation program assessing its potential for regional scalability at health system level.

- To launch community-based services to promote physical activity in chronic patients.
- **Structured service workflow definition using a collaborative & adaptive case management (ACM) approach**
 - To define workflows for the above services following a collaborative & adaptive case management approach, as reporter in Cano I et al. J Biomed Inform. 2015 Jun;55:11–22.
- **Development and implementation of an open ACM platform aligned with the regional interoperability program (IS3).**
 - To develop and validate an open collaborative & ACM platform on top of existing health information systems (SAP and eCAP) and aligned with the current regional interoperability logistics.
 - To elaborate a roadmap assessing convergence of current ICT-supported integrated care initiatives into the collaborative ACM platform alluded to above.
- **Transformation of the current personal health folder (La Meva Salut®) into a collaborative tool supporting patient self-management integrated with the regional interoperability program (IS3).**
 - Implementation and evaluation of the enhanced version of La Meva Salut® as tool fostering: i) collaboration between patient and professionals; ii) empowering for self-management; and, iii) materializing the concept of Digital Health Framework reported in Cano I et al J Transl Med. 2014 Nov 28;12 Suppl 2:S10. doi: 10.1186/1479-5876-12-S2-S10.

5. Change package (interventions)

Aims

The protocol uses a population-health approach to addresses the four aims displayed in Figure 1. Firstly, implementation of collaborative self-management services designed to promote PA in three study groups representative of different layers of the population-based risk stratification pyramid[21], namely: (i) Prehabilitation for high risk candidates to major surgery; (ii) Community-based rehabilitation for clinical stable chronic patients with moderate to severe disease; and, (iii) Promotion of physical activity and healthy lifestyles for citizens at risk and patients with mild disease. The second aim is adaptation and assessment of information and communication technologies (ICT) as supporting tools for both patients and professionals. Thirdly, the program evaluates the impact of each PA in terms of cost-effectiveness. Finally, the current study will generate a roadmap for regional adoption of the PA services.

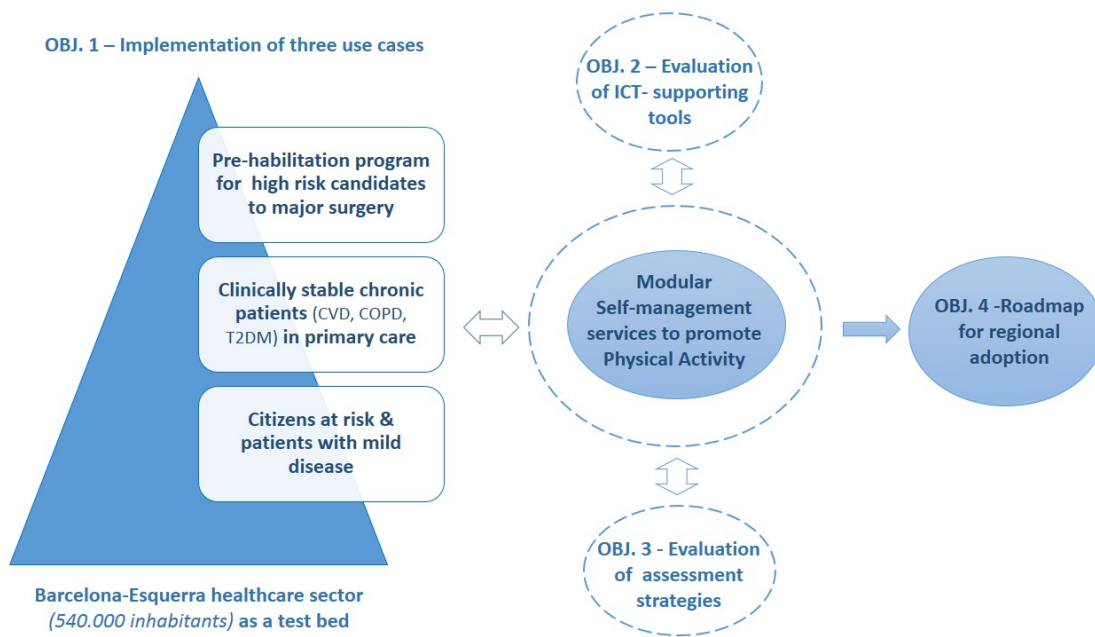


Figure 1 – The figure displays the four main objectives of the protocol considered as pivotal steps to achieve regional adoption of collaborative self-management services promoting physical activity across health-care tiers. Deployment of three use cases in one of the healthcare sectors of the city of Barcelona will target cardiovascular disorders (CVD), chronic obstructive pulmonary disease (COPD) and type 2 diabetes mellitus (T2DM). A patient-centered approach will be adopted. ICT stands for information and communication technologies.

METHODS

The setting

The protocol has been designed as part of the regional deployment of integrated care services in Catalonia (2016–2020). It has been conceived as a two-year (2017–2018) test bed period. At the end of the second year (2018), three main achievements will be in place. Firstly, the three implementation studies depicted in Figure 1 (Sections 1–3 in the supplementary material) will be adopted as mainstream services in one of the four healthcare sectors of the city of Barcelona, Barcelona-Esquerria (540.000 inhabitants). A second milestone will be the elaboration of a plan for generalization of the PA services approach to other non-pharmacological interventions. Thirdly, a roadmap for regional deployment of the PA services in Catalonia (7.5 million inhabitants) will be launched. The research was submitted to the Ethical Committee of the Hospital Clínic of Barcelona and it has been registered at clinical trial.gov (NCT pending)

Implementation studies

The three implementation studies depicted in Figure 1 will be conducted in parallel. The 24-month lifespan of the program will be divided in two main phases of approximately one-year duration each, as indicated in Figure 2.

The initial co-design PDSA (Plan-Do-Study-Act) cycle will be a low scale six-month period (m1 to m6) devoted to three milestones: (i) Co-design and refinement of the different service workflows; (ii) Set-up and assessment of ICT tools supporting the program; and, (iii) Identification of key performance indicators for long-term assessment of the regional deployment. During the second PDSA cycle (m7 to m12), the program will be adopted at pilot level in the healthcare sector. This second co-design phase will be used to: (i) Fine tune the services; (ii) Assess and refine ICT-supporting tools, as well as (iii) to consolidate the long-term evaluation plans. The two PDSA cycles will have a multidisciplinary approach including patients and health professionals with different profiles: physiotherapists, nurses, physical activity and sport sciences specialists, general practitioners, medical specialists and technologists.

At the end of the first year (2017), the program will be ready for its progressive rollout of the PA services such that they become mainstream services in the healthcare sector. Moreover, during the second year (2018), generalization of the PA program to other non-pharmacological interventions, as well as consolidation of the roadmap for regional scale-up in Catalonia, will be core milestones.

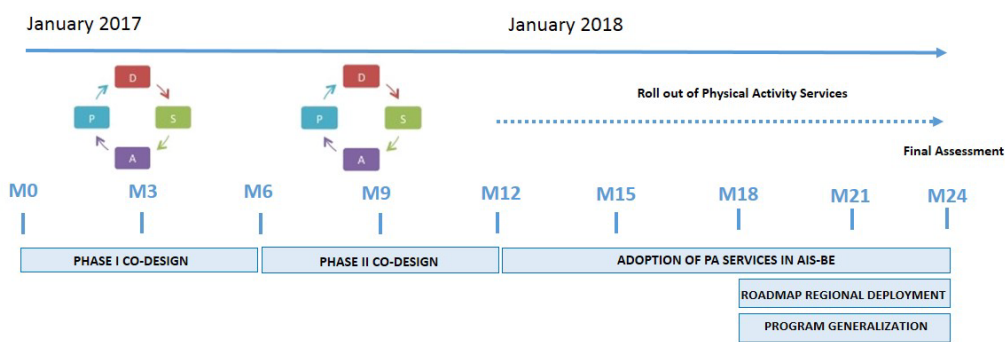


Figure 2 – Timeline of the program development. PDSA: Plan-Do-Study-Act. AIS-BE: Integrated Care Area of Barcelona-Esquerra.

Pre-habilitation for high risk surgical candidates (Section 1S in the supplementary material)

– A recent randomized controlled trial[23] has demonstrated high efficacy of a personalized prehabilitation service addressed to high-risk candidates for major abdominal surgery. The study showed both feasibility of the service, as well as a positive impact reducing incidence of postoperative complications. Briefly, the intervention consisted of a preoperative care plan conceived with an integrated approach including: (i) Supervised endurance training during 2 to 4-weeks; and, (ii) Personalized intervention to promote PA based on the

information provided by a motivational interview to the patients conducted by an specialized physiotherapist. The current protocol aims to rollout this prehabilitation service to all high-risk candidates to any major surgical procedure. At least 500 patients will be assessed within the program lifespan. Moreover, we plan to design and evaluate integrated perioperative care plans addressed to low and moderate risk patients aiming at bridging between community-based and specialized care.

Community-based rehabilitation for clinical stable chronic patients (Section 2S) – Health value generation by personalized PA services including endurance training and PA promotion will be assessed in chronic patients with target diseases. Briefly, the six-month period intervention will have two phases including, as a first step, reassessment of the patient work plan aiming at optimization of both pharmacological and non-pharmacological therapies. The first phase of the intervention will begin with an individual motivational interview wherein the intervention will be explained and co-designed with the patient. It will be followed by: (i) Supervised endurance training sessions with a flexible duration of 2 to 6 weeks; (ii) Promotion of active life-style; and, (iii) Patient empowerment for self-management of his/her condition aiming at increasing program adherence. The second phase of the intervention will include promotion of PA and self-management using a Personal Health Folder (i.e., Cat@Salut LMS) with remote off-line supervision by a case manager. During the two-year period, up to 800 patients will be assessed.

Promotion of physical activity for citizens at risk & mild disease patients (Section 3S) – The main objective is to assess the impact of a program promoting healthy lifestyles on PA in citizens at risk and patients with mild chronic disease. Briefly, key aspects of the intervention are: (i) Motivational interview to personalize the PA service; (ii) Familiarization of the candidate with the use of the PHF as a self-management tool; and, (iii) Assignment of one case manager for off-line remote surveillance of the service. Moreover, the subject will receive information on a portfolio of optional services offered by the PA service. The protocol is planning to asses 1.000 patients during the two-year period.

Technological support

The collaborative clinical processes for the three implementation studies will be facilitated by a process engine supporting adaptive case management[25], which will be built on top of current hospital information systems using existing regional interoperability infrastructures (Section 1S). Moreover, the regional PHF will be adopted to support patient empowerment, self-care, monitoring and adherence (supplementary material).

6. Key Performance Indicators

Evaluation strategies

The PA program assessment will include: (i) Evaluation of the rollout of each of the three implementation studies (Sections 1S to 3S); and, (ii) Long-term assessment of the entire program beyond the two-year lifespan of the protocol. To assess cost-effectiveness of the deployment, interventional areas will be compared with matched control areas taking into account three categories of indicators: (i) program specific; (ii) maturity of the deployment process; and, (iii) impact of healthcare outcomes. To this end, implementation research tools organized within the frame of the Model for ASsesment of Telemedicine applications (MAST) will be considered. Additional information is provided in Section 5S of the CCP manuscript (CAT CHRON CM). It is planned to reach full consensus on Key Performance Indicators by early February 2017.

Collaborative Methodology: Baseline Regional Report (Catalonia) - Community-based Collaborative Management of Complex Chronic Patients (AISBE-CCP) (CAT CHRON CM)

The first phase of the collaborative methodology in ACT@Scale project is that of the baseline. Below template to document the information to be gathered.

1. Topic selection

The drivers to facilitate the scaling-up of the “Community-based Collaborative Management of Complex Chronic Patients (AISBE-CCP) (CAT CHRON CM) program chosen are:

A. Optimization of recruitment, service selection and service dynamic adaptation

B. Sustainability and business case

In a second step (Spring 2017), we might joint D. Citizen empowerment. The current report only includes drivers B and C.

2. Multidisciplinary team (number and profile)

The current multidisciplinary team works in full alignment with the different AISBE committees addressing the organizational change between specialized & community-based care in the healthcare sector of Barcelona-Esquerra. Main characteristics of the active programs are reported in the references below. Moreover, an updated description of the CCP program has been updated in the Thick Description of the SELFIE project (<http://www.selfie2020.eu/selfie-project/>) about to be published in the project website.

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For the period May to December 2016, the composition and roles of the multidisciplinary team are described below. However, this multidisciplinary team will be expanded after January 2017 within the frame of the NEXTCARE program (www.nextcarecat.cat) briefly described below. The plan is to enrich the team with additional managers, health professionals, social workers and patients.

Since the early days (2005), the AISBE program has been looking for convergence between deployment of mainstream integrated care services and development of an ecosystem of innovation. Recently, such a convergence has been formulated through the NEXTCARE (Innovation in Integrated Care Services for Chronic Patients), a RIS3 (Research and Innovation Strategies for Smart Specializations) initiative (2016–2020). NEXTCARE, launched in November 2016, addresses five actions that encompass the main challenges encountered during the deployment of integrated care. Action 1 deals with Health Risk Assessment and Stratification. Action 2 aims at promoting healthy lifestyles with focus on physical activity. Action 3 deploys community-based management of complex chronic patients (CCP). Action 4 deals with regional deployment of transfer of diagnostic testing to primary care focusing on forced spirometry as a use case. Finally, Action 5 promotes interoperability between healthcare, informal care and biomedical research conforming the so-called Digital Health Framework, as a technological facilitator supporting collaborative and adaptive case management (ACM).

It is of note that the current AISBE-CCP program will be focused on Action 3 of NEXTECARE. That is, community-based management of complex chronic patients (CCP).

The multidisciplinary team is composed by different members, the functions and roles are:

- *Organizer*: Two members with skills in leading team dynamics
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- *Decision makers*: One decision maker representative of the Healthcare Directorate of AISBE
- *Project Manager*: One project manager of the CCP program
- *Total participants*: 13

As indicated above, the multidisciplinary group should be expanded by the end of January 2017.

3. Improvement areas

The improvement areas selected within each driver are:

- Poor clinical risk assessment without considering the population-based stratification of patients
- Arbitrary criteria currently used for clinical risk assessment and stratification, not based on computational predictive models properly evaluated on a prospective basis.
- Static risk assessment and stratification not taking into consideration dynamic changes of the patients.
- Risk assessment and stratification exclusively based on clinical criteria.
- Insufficient implementation of patient (case) management based on clinical process definition. Formal definition of flexible (adaptive) service workflows is needed.
- There is a clear need for further refinement of some mainstream integrated care services (i.e. home hospitalization, integration between specialized & community-based services, etc...) in order to enhance bridging with community-based services.
- There is need for convergence of ICT-supporting tools used in several ongoing mainstream services with an integrated care approach (i.e. AIDS-HIV, tele-dermatology, home hospitalization, etc...).
- Existing ICT-supporting health information exchange among healthcare providers is insufficient to facilitate collaborative work among health care professionals across healthcare tiers.
- Existing ICT-supporting tools are insufficient to foster patient empowerment of self-management, as well as for integration of informal care information (i.e. social support needs) into the clinical decision making process.

4. Objectives

Agree and describe the progress you want to achieve on each improvement area.

➤ **Enhanced clinical risk assessment and stratification**

- Evaluation of the potential of the population-based health risk assessment tool in Catalunya (GMA, Adjusted Morbidity Groups) to enhance clinical risk prediction.

- Generation and evaluation of dynamic risk predictive modelling for stratification of patients included in the home hospitalization program.
 - Generation and evaluation dynamic risk predictive modelling for enhanced transitional care and long-term community-based management of chronic patients.
- **Service refinement**
 - To expand and refine the current home-hospitalization program assessing its potential for regional scalability at health system level.
 - To design enhanced transitional care services bridging hospital and community.
 - Further refine current long-term community-based management of complex chronic patients (CCP) to overcome current limitations for generalization reported in Hernandez C et al ([NPJ Prim Care Respir Med.](#) 2015 Apr 9;25:15022).
 - **Structured service workflow definition using a collaborative & adaptive case management (ACM) approach**
 - To define workflows for the above services following a collaborative & adaptive case management approach, as reporter in Cano I et al. J Biomed Inform. 2015 Jun;55:11–22 further elaborated below.
 - **Development and implementation of an open ACM platform aligned with the regional interoperability program (IS3).**
 - To develop and validate an open collaborative & ACM platform on top of existing health information systems (SAP and eCAP) and aligned with the current regional interoperability logistics.
 - To elaborate a roadmap assessing convergence of current ICT-supported integrated care initiatives into the collaborative ACM platform alluded to above.
 - **Transformation of the current personal health folder (La Meva Salut®) into a collaborative tool supporting patient self-management integrated with the regional interoperability program (IS3).**
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5. Change package (interventions)

The interventions/changes to be carried out have to be defined: develop specific ideas for changes that lead to scaling up within the selected drivers in each good practice; agree on

interventions; and document the “change package”. They will be further refined once the first PDSA cycle starts.

Specific interventions for large scale deployment of all the concepts indicated above are described in the core manuscript and on-line supplementary material recently submitted to *npj Primary Care Respiratory Medicine* under the title *Regional Implementation of Community-based Collaborative Management of Complex Chronic Patients*.

A brief description follows:

Aims

The CCP protocol addresses the five aims displayed in Figure 1. Firstly, implementation of two integrated care interventions using a collaborative ACM approach: i) Community-based management of CCP; and, ii) Integrated care for patients under long-term oxygen therapy (LTOT), described in detail in Sections 1S and 2S, respectively. The second aim is adoption of information and communication technologies (ICT) required to support collaborative ACM (described in detail in Section 3S). Thirdly, the program evaluates the impact of enhanced clinical health risk assessment and stratification (described in detail in Section 4S). The fourth aim is assessment of healthcare value generation of the services (described in detail in Section 5S), both during the deployment phase and after regional scale-up of the novel services. Finally, the current study generates a roadmap for regional adoption of the CCP program. The protocol emerges from previous studies that have generated solid evidence on efficacy of the interventions as well as their high potential for health value generation.

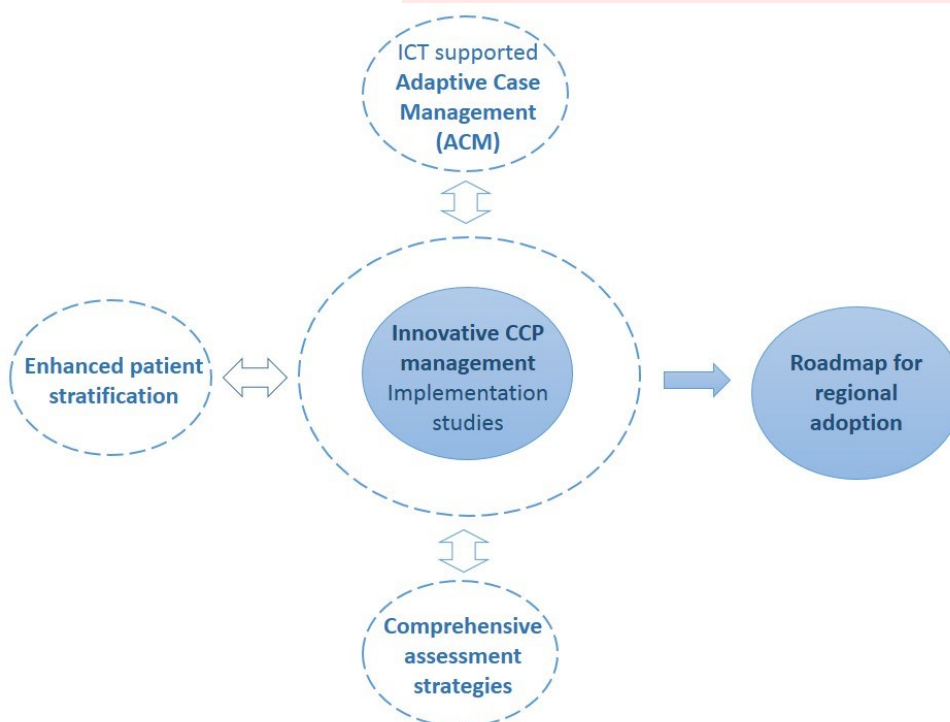


Figure 1 – Five pivotal aims to achieve successful regional adoption of the community-based program for collaborative management of complex chronic patients (CCP) across health-care tiers.

The setting

The current manuscript describes the program for large scale deployment of integrated care services for CCP undertaken in the healthcare sector of Barcelona-Esquerra (AISBE) (520k citizens) and in two other areas of Catalonia: Badalona Serveis Assistencials (BSA) (420k citizens) and Lleida (366k citizens). The study also addresses the steps for scale-up of integrated care in the entire Catalan region (7.5M citizens). The program is being developed under the umbrella of the Catalan Government Health Plan 2016–2020 and it is supported by the convergence of resources among innovation plans of healthcare providers, public resources and manpower from different grants. The research was submitted to the Ethical Committee of the Hospital Clínic of Barcelona and it has been registered as at clinicaltrials.gov¹.

Implementation studies

The total program duration will be 42 months, from mid-2016 to end-of-2019 (Figure 2). On January 2017, the two implementation studies will be initiated at AISBE. Observational studies with matched controls have been planned for both Community-based management of CCP (n=3,000) (Section 1S) and for Integrated care for patients under LTOT (n=500) (Section 2S)¹⁹. Moreover, clustered randomized controlled trials are planned on top of the observational studies to test specific questions (i.e. performance of the ICT platform providing ACM functionalities) (Section 5S).

The program Community-based management of CCP includes patients showing moderate to high risk of early re-admission recruited immediately after hospital discharge. The service workflow has two sequential phases with specific target outcomes for each of them: i) Short-term intervention to prevent early (30 and 90 days) hospital-related events; and ii) Intervention to enhance community-based long-term management of CCP. Likewise, the second implementation study will assess deployment of integrated care for patients under LTOT aiming at: i) Enhance adequacy of LTOT prescription; ii) Improve adherence to LTOT; and, iii) Generate healthcare value through collaborative ACM of these patients.

In the other two sites (Lleida and BSA), the implementation studies will begin by mid-2017 in order to facilitate site adaptation of the service workflows. An initial assessment of all

¹ <https://clinicaltrials.gov/>. Implementation of Community-based Collaborative Management of Complex Chronic Patients (Nextcare_CCP). NCT02956395

implementation studies, as described in Section 5S, will be done after 18 months of the trials initiation in each of the sites. The timeline of the CCP program is indicated in Figure 2.

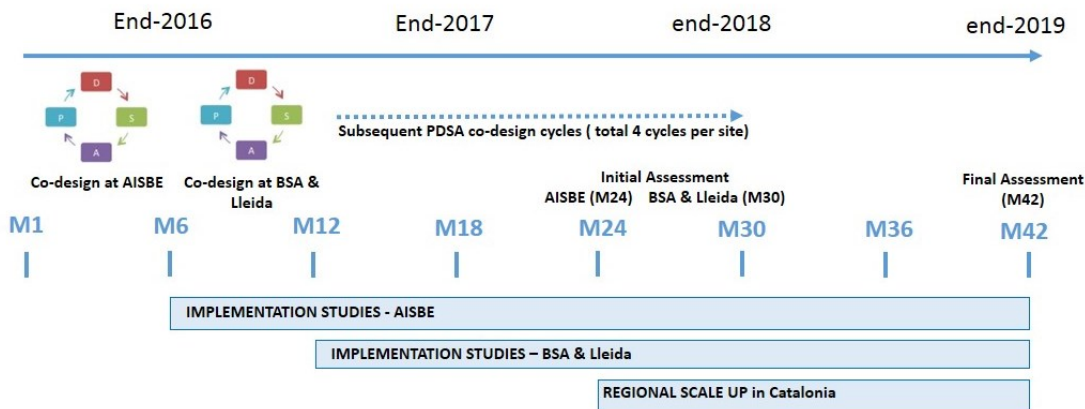


Figure 2 – Timeline of the program for large scale deployment of CCP management in Catalonia. A co-design process following a Plan-Do-Study-Act (PDSA) methodology will be carried out in each site by a multidisciplinary team including: primary care professionals (general practitioners, nurses, and social workers), specialists (doctors, allied health professionals), technologists, patients and caregivers. A total of four PDSA cycles, six-month duration each, are planned in each site. At the end of the assessment of the implementation studies (M42), a consensus on key performance indicators for follow-up of program adoption beyond the current study will be achieved.

Service workflows: ICT-supported Adaptive Case Management

Adoption of adaptive case management (ACM) to support collaborative work constitutes an innovative approach that facilitates case managers planning at run-time using well-structured service workflows, as extensively described in Section 3S. This implies selection and scheduling of specific tasks during case management and ad-hoc collaboration with other professionals across healthcare and social support tiers. It is of note that ACM facilitates decisions triggered by expected and unexpected events.

The two target use cases will be supported by an open ACM platform built-up on top of the current health information systems of the different healthcare providers and using existing regional interoperability infrastructures. In order to support both patient collaborative work and self-management, the personal health folder (PHF) already deployed in the region is currently being adapted for the purposes of the program as a key component of the Catalan Digital Health Framework (Section 3S).

Enhanced clinical risk assessment strategies

The CCP program acknowledges that health risk prediction and stratification is as a relevant driver for large scale deployment of integrated care. Accordingly, the project will use the

regional population–health risk assessment tool (GMA, Adjusted Morbidity Groups) to enhance clinical risk assessment and stratification following the approach reported in Dueñas I et al BMJ Open 2015 and summarized in Section 4S.

CCP program evaluation

The CCP program assessment strategy has a twofold aim: i) Evaluation of the two implementation studies in the three sites (Sections 1S and 2S); and, ii) Proposal of key performance indicators for long-term assessment of integrated care services for CCP beyond the lifespan of the project. To this end, implementation research tools organized within the frame of the Model for ASsesment of Telemedicine applications (MAST) will be considered (Section 5S).

Roadmap for CCP program adoption

Lessons learnt in the three sites will help to shape large-scale deployment of the CCP program into the entire Catalan region during the last 18-months of the project lifespan. The complexities involved in the implementation of the program advice to adopt a building blocks approach, as illustrated in Figure 2 and described below.

Initial deployment in AISBE. An initial six-month co-design cycle (PDSA) (end of 2016) cycle will be undertaken only in AISBE healthcare sector. It will be done in parallel with completion of pending tasks to adapt the regional PHF (La Meva Salut®), as described in Section 3S.

The primary goals of the first PDSA cycle are: i) to confirm that the setting is fully operational; and, ii) to assess acceptability of the entire process by end-users; that is, health professionals, social workers, patients and caregivers. It will also include analysis of acceptability of the proposed key performance indicators (Section 5S).

On January 2017, real world deployment of the two use cases will be initiated in AISBE. The initial evaluation will be done after 18 months. Within this period, three sequential PDSA cycles will be carried out with a twofold objective: i) to fine tune the design of the service workflows; and, ii) to consolidate the CCP program assessment strategy.

Scale-up of the CCP program – In both BSA and Lleida, the first six-month PDSA cycle for site adaption of the two service workflows will begin on January 2017; whereas the corresponding implementation studies will be initiated by mid-2017.

6. Key Performance Indicators

Description of Section 5S of the CCP manuscript follows. It is planned to reach full consensus on Key Performance Indicators by early February 2017.

Rationale & Hypothesis – Poor comparability among interventions carried out in different studies constitutes one of the most important hurdles for assessing effectiveness and health value generation of integrated care in CCP management. The aim of the current section is to describe the assessment strategy such that current limitations can be overcome. It is hypothesized that the use of well-structured, but flexible, service workflows with an ACM approach will facilitate comparability of the results beyond the lifetime of the current CCP program.

Two assessment dimensions – The CCP program is addressing two well differentiated areas in terms of assessment. These are:

- Effectiveness and healthcare value generation of the two implementation studies described in Sections 1S and 2S, respectively.
- The Plan-Do-Study-Act (PDSA) cycles will be conducted by a multidisciplinary group of stakeholders as described in the legend of Figure 2. The purposes of the PDSA cycles are: i) Adjust the specifics of the service workflows to the characteristics of the healthcare sector before initiation of the implementation studies; ii) Refine the different dimensions assessed throughout the lifetime of the implementation studies such that a final version of the service workflows can be achieved after the initial 18-months of deployment; iii) assess suitability and acceptance of key performance indicators (KPIs) to assess the corresponding implementation study; and, iv) generate consensus on the KPIs to be used for long-term follow-up of the integrated care services beyond the project lifetime.

The initial proposal for KPIs will be proposed during the initial PDSA (Figure 2). It will be based on the assessment of four categories of variables: i) Characteristics of the target population; ii) Intermediate outcomes indicating adequacy of utilization; iii) Process indicators reflecting life styles and empowerment; and, iv) Structure indicators of integrated care. The proposal takes as a basis the set of eleven indicators jointly suggested by AQuAs (Catalan Agency for Health Quality) and the Spanish Government to assess integrated care for chronic patients (2016). This set of eleven core indicators will be enriched with additional variables reflecting specificities of the two implementation studies deployed in the current program.

Highlights on evaluation tools – The method for Assessment of Telemedicine Studies (MAST) has progressively consolidated as a reference tool at European level. The CCP

program will use the short version of MAST, including its seven dimensions, as the conceptual frame to organize and report the assessment results.

The CCP program will also explore the role of innovative approaches such as Multi-Criteria Decision Analysis (MCDA) to assess healthcare value generation. The MCDA approach combines indicators from several dimensions, namely: i) Changes in the process of care delivery; ii) Changes in patient lifestyle and self-management behaviour; iii) Changes in Biomedical, Physiological and Clinical Health outcomes; iv) Changes in Health-related quality of life; and, v) Changes in final health outcomes, assessing related costs. The method was initially developed for evaluation of disease-oriented management programs. But it seems reasonable to explore the potential for generalization of the method for assessment of case-oriented management programs.

Collaborative Methodology: Baseline Regional Report (Catalonia)- Integrated care for subacute and frail older adults (PSPV)

1. Topic selection

The program has chosen the following driver to work on to facilitate program up-scaling.

- A. Optimization of recruitment, service selection and service dynamic adaptation
- B. Citizen empowerment

2. Multidisciplinary team (number and profile)

The multidisciplinary team is composed by different members, the functions and roles are:

Supporting team:

- Organizer: MARCO INZITARI (Director of Healthcare, Research and Teaching of the hospital)
- Experts: MARCO INZITARI / NEUS GUAL (attending physician in the resource, and researcher on transitions of care) / PAMELA BURBANO (attending physician in the resource)

Core team:

- Decision makers:

MARCO INZITARI / PEDRO GARZÖN / GUIOMAR RIANO

- Project Manager and representative (being a single institution this is the person):

PAMELA BURBANO

- Implementers:

Connie E Caceres (physician), Raquel Dorado, Anna Yuste, Flor Man (nurses), Nuria Crespo (Physical therapist), Carolina Molins (Social)

3. Improvement areas

The team members have identified the following improvement area:

- Identify patients at risk of early readmission and difficult care transition.

4. Objectives

The objectives set up are:

- To implement a validated model to identify risk factors of early readmission, after testing different existing indicators.
- In parallel, we will develop an original proposal to study predictors of readmissions, and a new tool, based on the available data of the patients in the unit.

5. Change package (interventions)

The interventions to be carried out within Service Selection driver will be the following:

1. Stratification of patients at higher risk of early readmission. To improve the stratification, we will evaluate risk factors for early readmission such as; comorbidity, number of prescription drugs and social risk.
2. We will test existing tools (for instance Identification of Seniors At Risk (ISAR) tool, the MultiPrognostic Index (MPI) tool, the LACE score if feasible etc), and create a new tool if necessary.

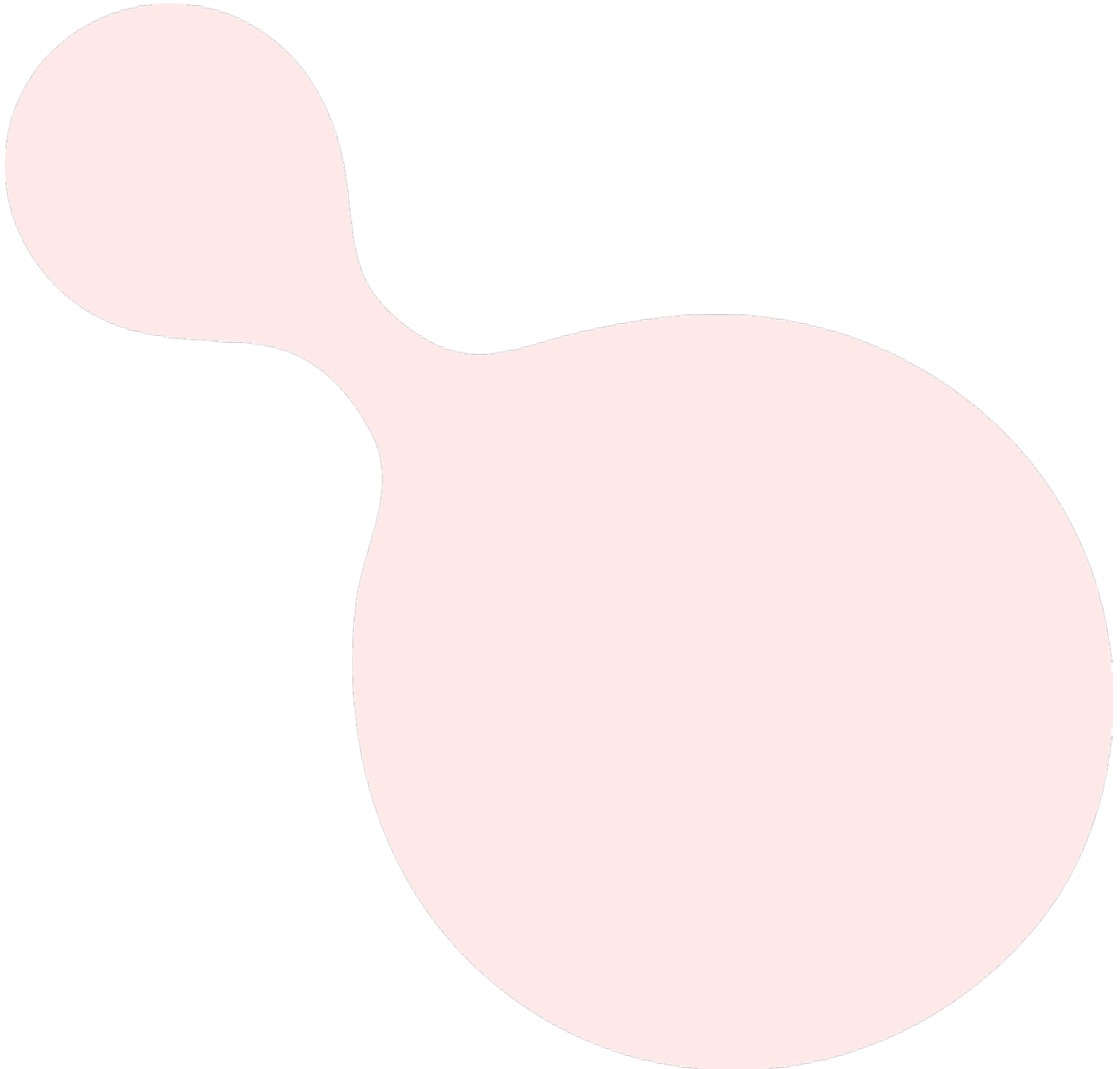
6. Key Performance Indicators

Possible indicators:

- Readmission rate and in the first 7, 30 and 90 days post-discharge.
- Days spent at home in the first 30 and 90 days.
- Transition to a long-term care facility or nursing home, in the following 3 to 6 months.
- Physical function at 30 days post-discharge.

- Adherence to medication and physical activity (process indicators).
- Evaluation of patient experience through questionnaires and individualized interviews, taking into account patients goals.
- Costs of the intervention and cost-effectiveness, compared to standard care.

We also plan to involve different stakeholders (primary care, patients and caregivers), in refining the design of the intervention.



Region of South Denmark

During the first six months of ACT@Scale, RSD has experienced certain challenges in the involvement of the identified telepsychiatric service and professionals. These challenges have emerged as the identified service is more mature than what was intended for ACT@Scale. Furthermore, the organisational set up required to participate in ACT@Scale does not exist in the current telepsychiatric service as the service has already moved beyond this stage. The challenges have resulted in a delay in the planned project activities, primarily the Collaborative Methodology.

Currently, RSD is working to engage a different telepsychiatric service and a new set of professionals to be part of ACT@Scale. The new service focuses on the use of telemedicine in diagnosing, treating and monitoring citizens suffering from depression. The involvement of this service will ensure a more coherent contribution to ACT@Scale. However, the schedule for the data collection and the collaborative methodology will be delayed as the new constellation and engagement have to be properly established. If the engagement of the new service is secured, the activities are expected to be initiated in January 2017 and the aim is to be in line with the rest of the consortium by March 2017.