

# ICT PSP – Health, Ageing and Inclusion Programme



## Health monitoring and sOcial integration environMent for Supporting WidE ExTension of independent life at HOME

(Grant Agreement No 250449)

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Reviewed by:	John Oates
Approved by:	Marco d'Angelantonio
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#### Abstract

This document identifies the data and indicators collected at the end of the trials,

#### Key Word List

SF-36, HADS, CGA, Social impact,

## Executive Summary

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The following indicators are measured / collected at the end of validation trials:

- SF-36, HADS and CGA

Questionnaires are administered at midterm, and held as part of the Case Report Form (CRF). Data will also be entered into the electronic CRF (eCRF).

Under the Trial Protocol, this data is monitored for data quality by the Medical Co-ordinator, but otherwise remains confidential until analysis is carried out at the end of the trial.

- Ex=post workflows

## Change History

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### Version History:

- 0.1 2<sup>nd</sup> April 2014
- 0.2 28<sup>th</sup> April 2014

### Version Changes

- 0.1 Initial draft & ToC
- 0.2 Section 6.2.2 (Louth), 5.5.5 (Badalona) and section 4.2.2 (Antwerp) updated

### Outstanding Issues

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# 1. Introduction

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## 1.1 Purpose of this document

This document sets out the indicators and data captured at the end of the validation trials.

It follows D7.1 Indicator measurements at validation start and D7.2 Indicator measurements at midterm.

This document is defined as an internal deliverable in the Technical Annex.

## 1.2 Glossary

<b>CRF</b>	Case Report Form
<b>eCRF</b>	Electronic Case Report Form

## 2. Indicators and data collected

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The indicators, data and questionnaires to be collected during the trials are defined in the following deliverables;

- D3.1 Clinical Impact indicator list.
- D3.2 QoL Questionnaire.
- D3.3 Social Impact indicator list.
- D3.4 Economic Impact indicator list.
- D3.5 User Satisfaction Questionnaires.

The data to be collected at midterm of the validation trials is set out below for each of these categories.

### 2.1 D3.1 Clinical Impact indicator list

The SF-36 and HADS questionnaires are administered at trial beginning, midterm and trial end.

CGA components (TGUG, Gait speed, Hand grip, MNA and Mini-Cog) are assessed at the same time points (beginning, midterm and end). CGA includes EFS and CGI.

All other outcomes are collected during the trial from patient records, by telephone interview and with the help of a patient-based diary.

### 2.2 D3.2 QoL Questionnaire

The SF-36, HADS and EFS questionnaires are administered at trial beginning, midterm and trial end, to both intervention group and control group.

### 2.3 D3.3 Social Impact indicator list

A baseline position was established by using questionnaires at validation start, covering personal, family and community domains. These domains will be assessed again at validation end.

### 2.4 D3.4 Economic Impact indicator list

Most of these indicators are collected during the trials.

The exception is ex-ante workflow analysis of selected processes to determine changes to workflow as a result of the HSH services. These will be analysed again at validation end.



## ID7.4 Indicator Measurements at validation end

### 2.5 D3.5 User Satisfaction Questionnaires

These are completed and collected at validation end only.

### **3. Measurements at Midterm**

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#### **3.1 SF-36**

Questionnaire is administered at trial end, and held as part of the Case Report Form (CRF). It will be entered into the electronic CRF (eCRF).

Under the Trial Protocol, this data is monitored for data quality by the Medical Coordinator, but otherwise remains confidential until analysis is carried out at the end of the trial.

#### **3.2 HADS**

As for SF-36 above.

#### **3.3 CGA**

CGA components: TGUG, Gait speed, Hand grip, MNA Mini-Cog, EFS and CGI.

As for SF-36 above.

#### **3.4 User satisfaction questionnaire**

Questionnaire is administered at trial end.



## 4. Antwerp, Belgium

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### 4.1 Data collected

The following questionnaires were administered to all participants in the Study Group and Control Group. All the responses were recorded in the Case Report Form (CRF), including:

- Edmonton Frail Scale (EFS);
- Short Form -36 (SF36) Survey;
- Hospital Anxiety depression Scale (HADS);
- Mini Nutritional Assessment® (MNA);
- Clinical Global Impression (CGI);
- Gait Speed Test (GST);
- Timed Get Up & Go test (TGUG);
- Clock Drawing Test;
- Hand Grip Strength (HGS);
- Mini-Cog: recall of words;
- Katz Index of Independence Activities of Daily Living;
- Social Impact Questionnaire.

### 4.2 Process workflows

#### 4.2.1 Ex ante

##### 4.2.1.1 The home care service delivery process

###### Service flats / individual homes Antwerp

Primary care basis (Primary Care Team - PCT)

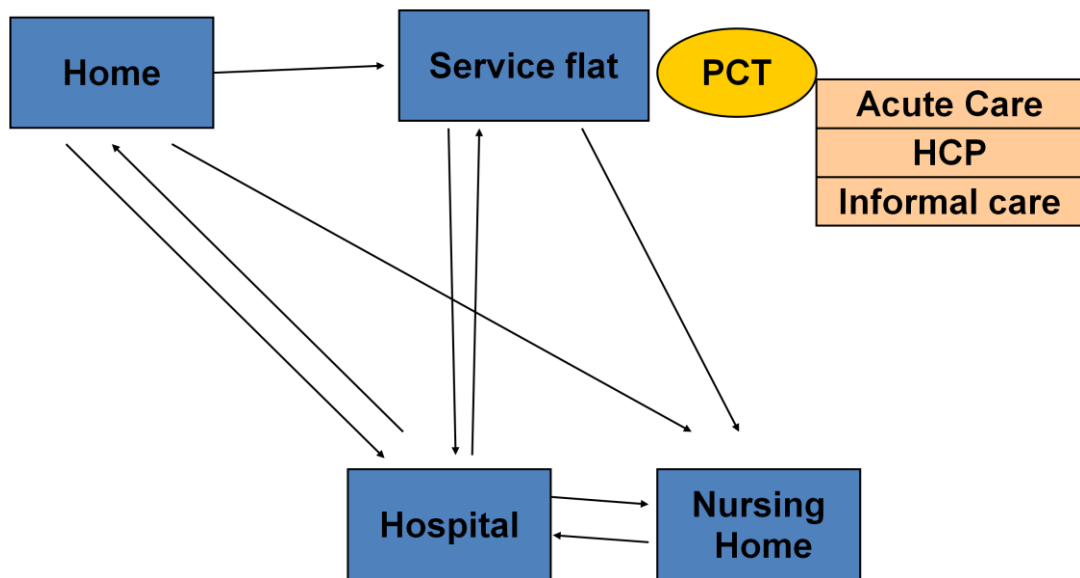
- Acute home care attention
  - Home Nurse;
  - Night care;
  - In case of emergency – 24h zorgsteunpunt.
- Home Care Program (HCP)
  - Occupational therapist;
  - Housekeeping, cleaning and home support.
- Informal Care
  - Outside the framework of organised, paid professional work. Provided by family members, friends and neighbours.

##### 4.2.1.2 The nursing home service delivery process

###### Nursing homes Antwerp

- 17 nursing homes close by service flats

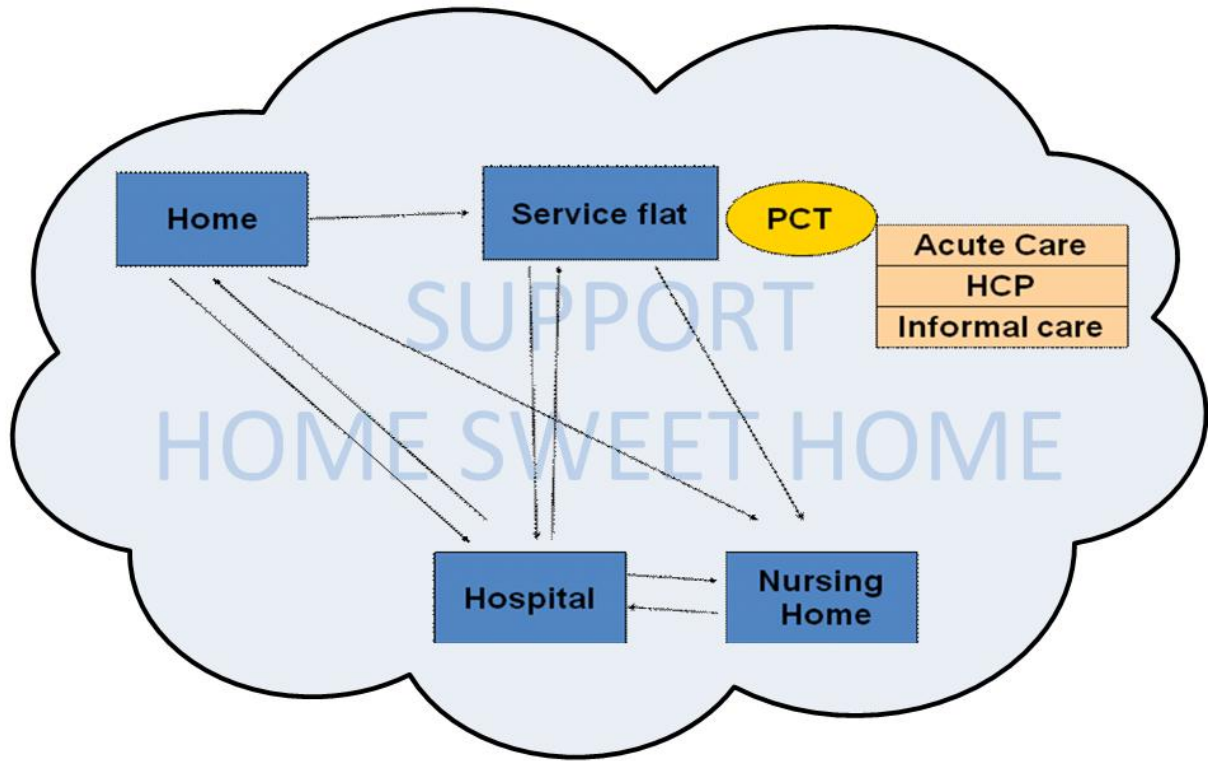
- Day care;
- Temporary care;
- Care flat;
- Residential stay.
- Facilities
  - Nurse;
  - Doctor;
  - Meals;
  - Medication;
  - Animation;
  - Kine-, ergo-, logo-, paliative care;
  - Care plan supported by care taker file.



#### 4.2.2 Ex post

When using the total installation provided by the Home Sweet Home project, there will be no change in the process workflow as designed above. But on top of all the care already provided, there is a need for a support team that follows up the technical and user interface part of the Home Sweet Home devices.

The Home Sweet Home support still has to be designed, in a bigger context, with all participants involved, but it will influence every part of the current care:



## 5. Badalona, Spain

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### 5.1 Data collected

The following questionnaires were administered to all participants in the Study Group and Control Group. These were administered in the CRF of BSA pilot site in the following order:

- Edmonton Frailty Scale (EFS) (including clock test and Timed Get Up & Go test (TGUG)).
- Katz Index of Independence Activities of Daily Living.
- Hand Grip Strength (HGS).
- Test Mini-Cog: recall of words and Clock Drawing Test.
- Clinical Global Impression (CGI).
- Hospital Anxiety depression Scale (HADS).
- Mini Nutritional Assessment® (MNA).
- Gait Speed Test (GST).
- Short Form -36 (SF36) Survey.
- Social Impact Indicators Questionnaires.
- User satisfaction.

### 5.2 Process workflows

#### 5.2.1 Ex ante

Workflows for the following processes have been collected:

- Home care service delivery.
- Home-based rehabilitation service.

For each process, the following details have been identified and collected:

- The steps in the process.
- Where each step is carried out.
- Who does it (the actors).
- A brief description of what is done.

The following abbreviations are used:

<b>HCP</b>	Home Care Programme
<b>HN</b>	Hospital Nurse
<b>PCC</b>	Primary Care Centre
<b>PCT</b>	Primary Care Team
<b>SHCT</b>	Specialised Home Care Team

### 5.2.1.1 The home care service delivery processes

- Primary care basis (Primary Care Team - PCT)
  - Acute home care attention.
    - Hospital Nurse (HN) detection: previous to home discharge
    - PCT detection: direct patient contact
  - Home Care Programme (HCP)
    - Specialised programme performed by moving PCT or PCT settled in the Primary Care Centre (PCC)
    - Preventive care, blood analysis, ambulances, medical interventions...
- Specialised Home Care Teams
  - Home Rehab Teams and Palliative Care Teams
    - Contacted by PCT or HN

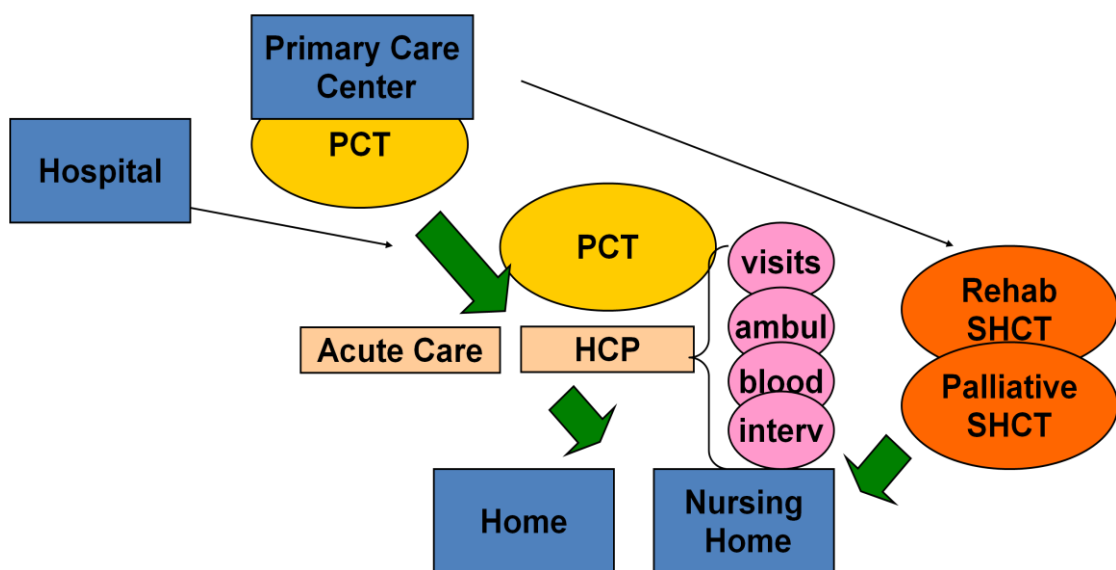


Figure 1: Catalonia - Home care service delivery processes

### 5.2.1.2 Home-based rehabilitation service processes

- Primary care basis (Primary Care Team - PCT): on common patient or on HCP patients
  - PCT contacting
    - Rehabilitation Team: external health provider
    - SHCT – Rehabilitation team: comprehensive rehab
- Hospital wards
  - Hospital Nurse contacting:
    - Rehabilitation Team: external health provider
    - SHCT – Rehabilitation team: comprehensive rehab
- Outpatients
  - Physician / specialist contacting:
    - Rehabilitation Team: external health provider
    - SHCT – Rehabilitation team: comprehensive

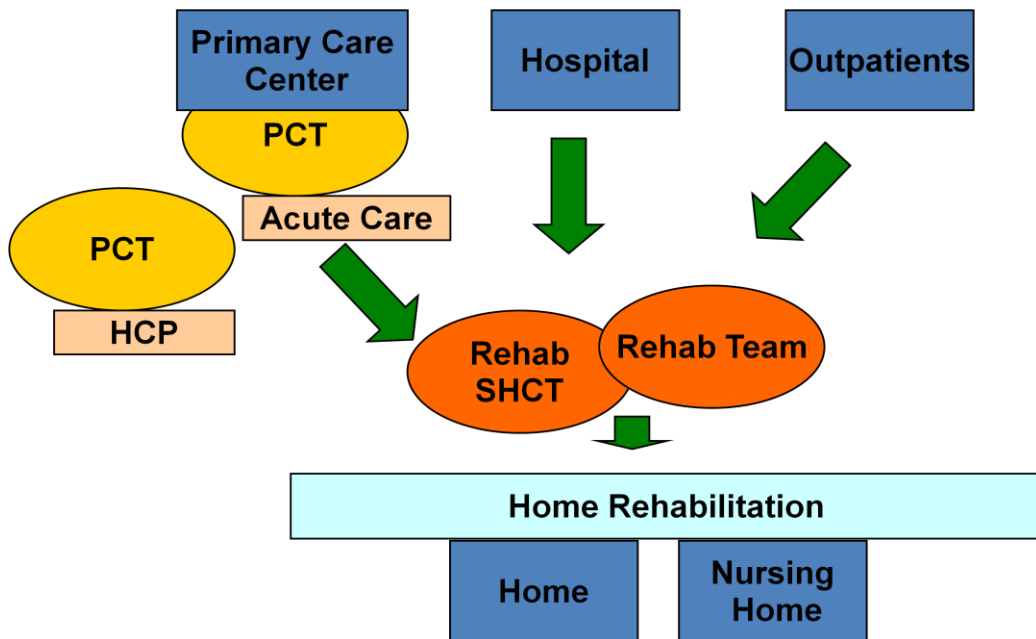


Figure 2: Catalonia - Home-based rehabilitation service processes

### 5.2.2 Ex post

#### Home Care service delivery

As Home Sweet Home project proposes a home care service to prevent and detect acute situations in relation to chronic diseases in the frail population, we have been able to implement medical and social home support for the participants. Using the Call Centre and the medical and environmental devices, the participants have had a preventive tool that helps them to decide whether it is necessary to go to the GP, hospital, or to prevent risk situations, with the help of a team of specialised support.

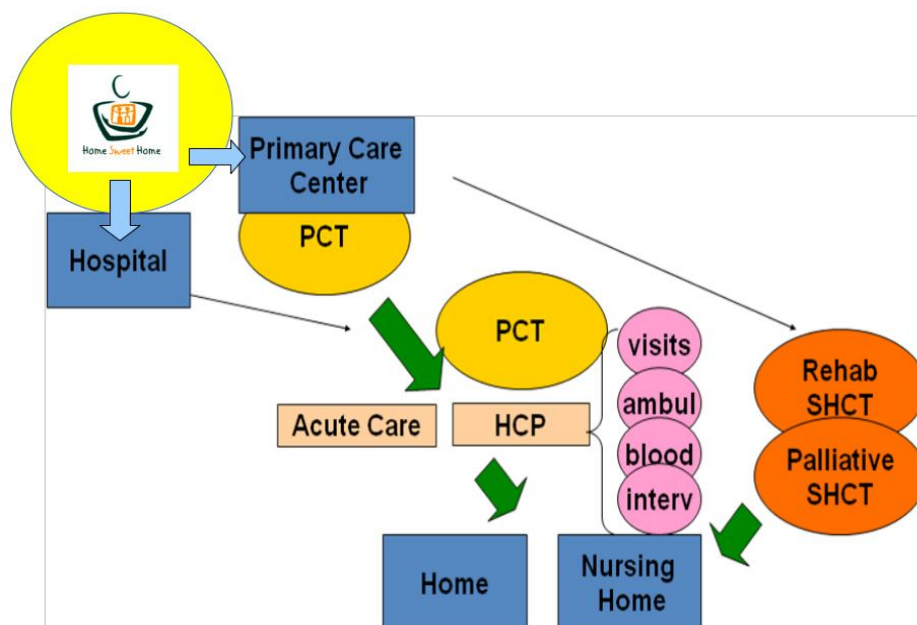


Figure 3: Catalonia - ex-post home care service delivery processes

## ID7.4 Indicator Measurements at validation end

However, even with the use of HSH platform, the process workflow has not been modified because its implementation does not modify the need for the medical teams. It provides quality and improved detection of acute situations and risks, but it does not replace any of the other processes.

Its application in the future could provide security for better control of the situations in the home care service.

### Home-based rehabilitation service processes

As with the previous service, the implementation of Home Sweet Home project in the process workflow would help in the home.

In those chronic cases handled by the home-based rehabilitation team, this would allow a more careful control of the situation by the use of medical and environmental monitoring devices proposed.

Also, if it could be implemented, it would allow the use of the other non-medical devices (*ello!* videoconference, Mambo®, diary, etc.) to complement the quality of life of the patient and improve their communication with the social environment, with a possible improvement in the cognitive and emotional areas that would enhance their rehabilitation process.

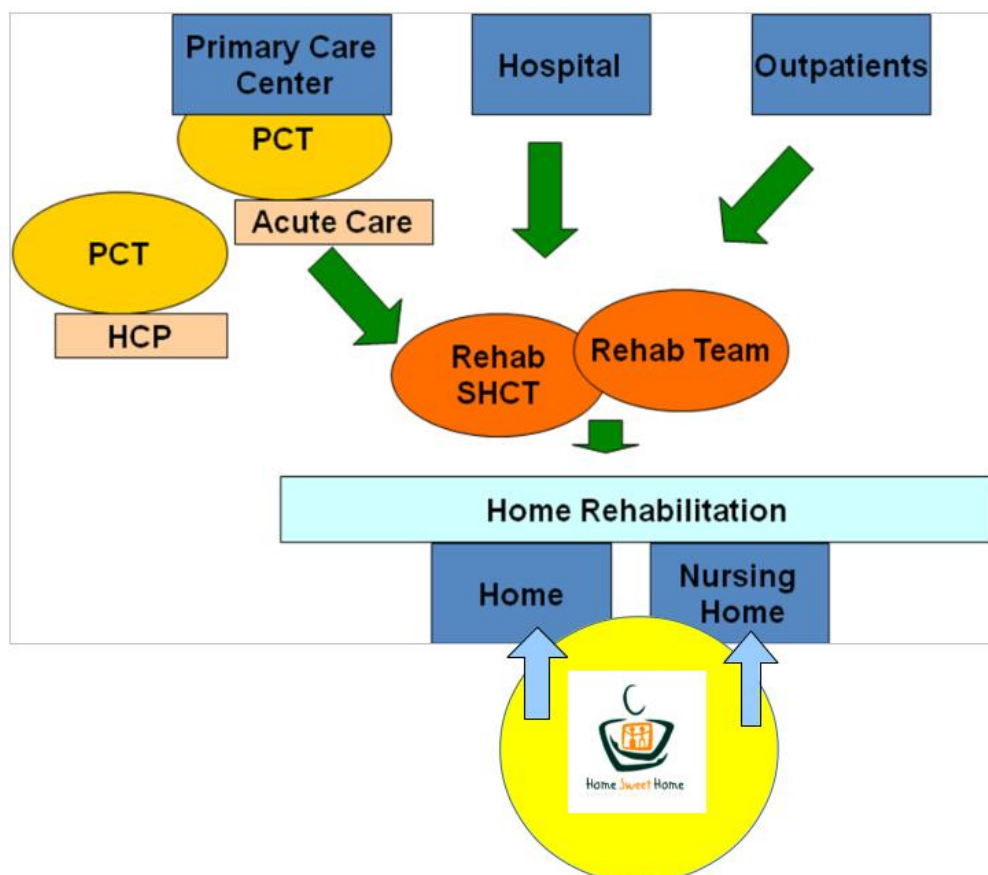


Figure 4: Catalonia - ex-post home-based rehabilitation service processes

## 6. Louth, Ireland

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### 6.1 Data collected

The following questionnaires were administered to all participants in the Study Group and Control Group:

- SF-36.
- HADS.
- CGA: components include TGUG, Gait speed, Hand grip, MNA Mini-Cog, EFS and CGI.
- Social Impact questionnaire
- User Satisfaction
- Qualitative Interviews.

### 6.2 Process workflows

#### 6.2.1 Ex ante

##### **Notes on the preparation of ex-ante workflow analysis for tele-healthcare augmented integrated homecare services**

A current AS-IS (pre-technology) example from the Co Louth Site.

The diagram below is a high level process diagram for the current homecare service in Co Louth which currently excludes the use of tele-healthcare services.

From an overall perspective, the following should be noted:

- This is an initial draft snap-shot as an exemplar. Due to austerity measures and service cut-backs, the structure and organisation in the diagram is constantly under re-adjustment. It is at best approximation of the state of the service process as of late 2011. Specifically, there is a growing trend towards out-sourcing homecare support to private agency/homecare providers, in tandem with a reduction of carers under the direct management / employment of the HSE.
- Each box represents a sub-process that can be expanded further if necessary (denoted by a + after/under the process name).
- The active actors within the model are the Client/Family, the public health nurse (PHN), the director of the public health nursing service, the homecare office, and formal home carers. GP and emergency service providers can be modelled as 'black-box' services, but they are outside the normal ecology of the home support service.
- The model supports a 'cultaca' (service broker for older people) but does not demand one (primarily in the role of referral and service planning).



## ID7.4 Indicator Measurements at validation end

- For the purposes of clarity at this stage, the home support / carer workers will be assumed to be HSE employees or sub-contractors.

From a process perspective, the following should be noted:

- Referral – there are multiple starting points – referral sources/inputs to initiate the process. (GPs, Cultaca, primary care team, social worker, elder abuse). However, the PHN serving the client area is the concentration point to initiate the process. Each PHN is a nurse in general community practice (not a ANP in community gerontology) and generally serves a population of approximately 3,000 residents within a primary care team area of about 10,000 people.
- Assessment – an initial holistic assessment is undertaken by the PHN – including a brief home/environmental survey – may be augmented by MDT (multi-disciplinary team) if necessary. There are moves to a common assessment form to address both homecare and residential care needs.
- Service design – involves the design of a care plan for identified/eligible needs. It includes a resource estimate – normally expressed in hours of support/week. In many instances, support is only available over the five-day week period.
- The initial plan is approved by the director/assistant director of PHN. Subsequent modifications or adjustments can be made locally subject to a threshold.
- Assignment set up involves resource assignments, and scheduling of carer hours. The carer is notified and makes the first visit. In most instances, the client and carer are compatible and the service can develop as a series of scheduled events/visits. If there is a significant incompatibility/mismatch, a different carer can be assigned.
- Service delivery events are identified as planned or un-planned.
- Much of the review effort is directed at reconciling the conflicting demands of trying to reduce home support hours (scarce resources) against increasing demands as clients functional capabilities diminish.
- Should a client's capabilities decline below a safety threshold for independent living, and the family or home support structure can no longer provide a viable home-based service, the client/family may choose to submit a CSAR application (Common Service Assessment for Residential Care) to initiate the process of moving to a residential care setting.

From a notation perspective, the following should be noted:

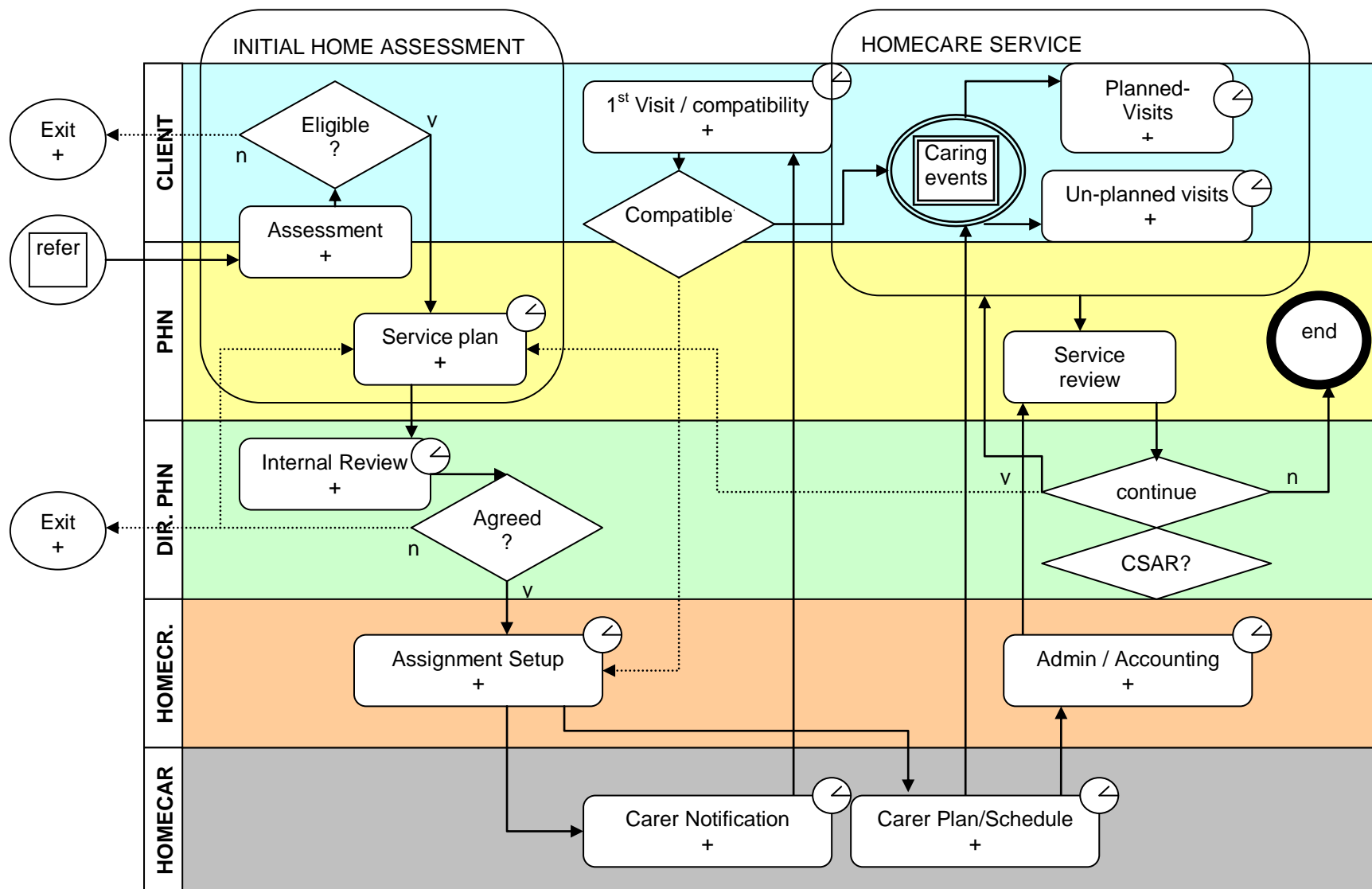
- The new BPMN (Business Process Management Notation) notation standard has been used.
- We have used tram-lines to visualise cross agency/department interactions and message flows.
- The clock symbols highlight processes/activities or task that have a time dependency – either scheduled or response.

From an 'as-is' view towards 'readiness to change', when considering an analytical / cost benefit perspective, the following should be noted:

## ID7.4 Indicator Measurements at validation end

- The service set up efforts will be more challenging in the initial periods as practices change and person-centred approaches to maximising the client's involvement are bedded down.
- The service performance drive will be to optimise (v. minimise) human and digital connectivity with the client based on their needs and wishes.
- There are immediate, fast response cross over points where a call could prompt an un-planned visit.
- The cost-benefit will be seen as a service optimisation over a community of clients with a service team – rather than specific saving on an individual case.
- Where single case cost benefit is highlighted, it will be through comparison with alternative modes of care (long term care etc.), through the analysis of individual pathways etc.

The following diagram is the high level service process map.



## 6.2.2 Ex post

### Notes on the preparation of ex-post workflow analysis for tele-healthcare augmented integrated homecare services.

The diagram below is a high level process diagram for a revised homecare service in Co Louth using the Home Sweet Home solution which incorporates the inclusion of tele-healthcare services.

From an overall perspective, the following should be noted:

- This is an initial view taken after the end of project trials. It has not yet been through an internal review, which may result in iterative improvements.
- Each box represents a sub-process that needs to be detailed further (denoted by a + after/under the process name).
- The active actors within the model will be the home support office and home care workers, the primary care team / public health nurse, the client and client family and friends, and the tele-healthcare service provider. GP and emergency service providers will be modelled as 'black-box' services.
- The tele-healthcare provider is represented as a third party service provider.
- The mode supports a 'cultaca' (service broker for older people) but does not demand one.
- For the purposes of this exercise, the home support workers will be assumed to be HSE employees or sub-contractors.

From a design perspective, the following should be noted:

- Referral – there are multiple starting points – referral sources/inputs to initiate the process.
- Assessment – an initial holistic assessment is undertaken by the PHN – including a brief home/environmental survey – may be augmented by MDT (multi-disciplinary team) if necessary
- Service design – involves the design of an integrated service plan including both homecare and tele-healthcare interventions. It includes a resource estimate.
- The initial plan is approved by the director/assistant director of PHN. Subsequent modifications or adjustments can be made locally subject to a threshold.
- Set up involves resource assignments, and technical configurations.
- Service delivery events are identified as planned and un-planned, as they relate to either visits or tele-connections

From a notation perspective, please see section 6.2.1 above.

From an analytical/cost benefit perspective, the following should be noted:

- The service set-up efforts are more challenging in the initial periods as practices change and person-centred approaches to maximising the clients involvement are bedded down.

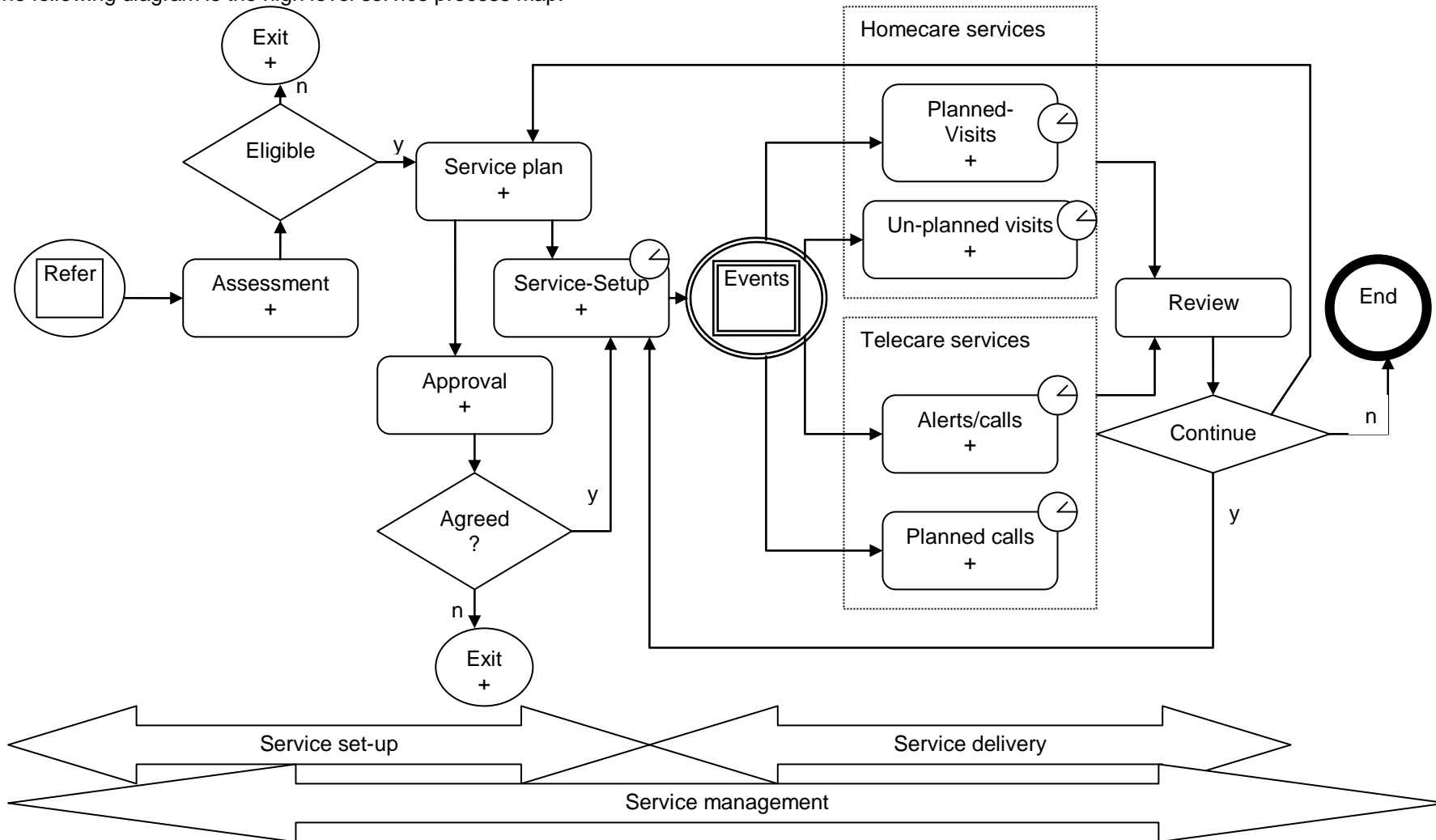
## ID7.4 Indicator Measurements at validation end

- The service performance drive is to optimise (vs minimise) human and digital connectivity with the client based on their needs and wishes.
- There are immediate, fast response cross over points where a call could prompt and un-planned visit.
- The cost-benefit will be seen as a service optimisation over a community of clients with a service team – rather than specific saving on an individual case.
- Where single case cost benefit is highlighted, it will be through comparison with alternative modes of care – long term care etc – through the analysis of individualised pathways etc.

Further steps for consideration are:

- To review the high-level map.
- To detail the sub-processes using pool/tramline diagram conventions.
- To identify the supporting resources, capabilities and document dataflow.
- To detail the clock/time specific activity demands.
- To document the back-box interactions.
- To run a desk-simulation to identify service improvement opportunities and cost optimisations.

The following diagram is the high level service process map.



## 7. Latina, Italy

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### 7.1 Data collected

The following questionnaires were administered to all participants in the Study Group and Control Group:

- SF-36.
- HADS.
- CGA: components include TGUG, Gait speed, MNA, Mini-Cog, EFS and CGI.

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