D7.2 INTERIM PROCESS EVALUATION REPORT

WP7 Evaluation

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ABSTRACT

This deliverable presents the preliminary results of CareWell on a site by site basis. All sites were requested to provide their current flow chart and input for a table on demographic characteristics of end users.

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Kronikgune

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OUTSTANDING ISSUES

None

FILENAME

D7.2 v2.0 CareWell Second interim evaluation report

STATEMENT OF ORIGINALITY

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Executive Summary

The aim of CareWell is to propose, implement and validate new integrated care models for patients with multiple comorbidities that are cost-effective, using different routes, such as improving home-based patient care, thereby preventing their hospitalisation, and improve communication channels between (healthcare and social) professionals and patients and/or carers to facilitate the exchange of information for each patient, thereby avoiding duplication of effort.

The overall aim of the evaluation described in this report is to identify the differences introduced by implementing ICT supported integrated healthcare in different domains. The evaluation uses the MAST framework, covering safety and clinical outcomes, resource use and cost of care, user/carer experience and organisational changes. This deliverable presents the preliminary results of CareWell gathered using the means, metrics and instruments defined in the evaluation framework (deliverable D7.1) at pilot site level.

This deliverable describes the health problem and characteristics of the application of the intervention. It describes the development and assessment of new models of integrated care targeting chronic complex patients. In the second part, the regions involved in CareWell project (Basque Country, Croatia, Lower Silesia, Veneto, Puglia and Powys) describe their integrated care pathways.

The report assesses the impact of the integrated care models implementation. The recruitment flow charts for all regions are presented, with a total of 932 patients included. A first baseline analysis is presented, which confirms that the patients included align perfectly with the proposed target population; they can be defined as an aged, multi-morbid population with complex health and social needs, who are satisfied with several aspect of the usual care but expressed the need to be more participative in the decision making process regarding their care.

The professionals' perspectives of the implementation processes have been collected and analysed. A qualitative evaluation of the processes related to the implementation of CareWell has also been performed to enable an understanding of the barriers and facilitators for implementing ICT-supported integrated care.

Finally, the report describes a predictive model in the form of a Budget Impact Analysis within the Deming’s plan-do-check-act cycle to manage continuous improvement in the implementation of integrated healthcare for multi-morbid patients.

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1.1 Purpose of the document

Deliverable D7.2 Interim Evaluation Report describes the preliminary results of CareWell at a local pilot site level.

This first interim report presents the background and first steps of the CareWell project. The MAST evaluation model has used as the framework for the comprehensive evaluation of this project.

This report is a second version of the Interim Evaluation Report that includes a more comprehensive quantitative baseline analysis, as well as a qualitative analysis of the barriers and facilitators found during the implementation. It also includes a new chapter on predictive modelling.

1.2 Structure of the document

The document is presented according to the MAST domains:

- Chapter 2 presents the results of Domain 1: Description of the health problem and characteristics of the application of the intervention.
- Chapter 3 presents the results of Domain 2 and 3: Safety, clinical and social effectiveness.
- Chapter 4 presents the evaluation of processes related to the implementation through the perspectives of healthcare professionals.
- Chapter 5 presents the economic aspects through a predictive modelling.

The guideline for the pilot sites on how the analyses are carried out and presented in the deliverable are attached as Annex 1.

1.3 Glossary

ADA	American Diabetes Association
CHF	Congestive Heart Failure
COPD	Chronic Obstructive Pulmonary Disease
CVD	Cardiovascular Disease
EASD	European Association for the Study of Diabetes
EHR	Electronic Healthcare Record
F2F	Face-to-face
GP	General Practitioner
HIS	Hospital Information System
ICT	Information & Communication Technology
IDF	International Diabetes Federation
LIS	Laboratory Information System
NCD	Non-Communicable Diseases
RIS	Radiology Information System

WHO	World Health Organisation

2. Domain 1: Description of the health problem and characteristics of the application of the intervention

2.1 Description of the health problem

Frail elderly patients are characterised as having complex health and social care needs; they are at risk of hospital or residential care home admission, and require a range of high level interventions due to their frailty and multiple chronic conditions. A growing proportion of the population in OECD countries are age 65 and over: 15% in 2010, and expected to reach 22% by 2030. More than half of all older people have at least three chronic conditions, and a significant proportion have five or more[1]. A recent US study indicates that more than 95% of Medicare patients with a chronic disease such as congestive heart failure, depression, or diabetes have at least one other chronic condition, and the majority (80%, 71%, and 56%, respectively) have four or more chronic conditions[2].

The CareWell project deals with multimorbid frail patients. Typically these patients have several diagnoses, the most frequent ones are Chronic Obstructive Pulmonary Disease (COPD), Diabetes and Congestive Heart Failure (CHF).

2.1.1 Chronic obstructive pulmonary disease (COPD)

Chronic obstructive pulmonary disease (COPD) is an umbrella term for a number of lung diseases that prevent proper breathing. Three of the most common conditions are emphysema, chronic bronchitis, and chronic asthma that is not fully reversible. These conditions can occur separately or together. The main symptoms are breathlessness, chronic cough and sputum production. Cigarette smokers and ex-smokers are most at risk. COPD used to be more common in men, but the disease is quite evenly spread across the sexes now that women and men smoke in equal numbers. Typically, COPD develops so slowly that the person does not realise their ability to breathe is gradually becoming impaired. The damage done to the lungs can be considerable before the symptoms are severe enough to notice.

Symptoms include: breathlessness after exertion (in severe cases, breathlessness even when at rest); wheezing, coughing, coughing up sputum, fatigue; cyanosis.

A person with COPD is at increased risk of a number of complications, including: chest infections and pneumonia, collapsed lung, heart problems and oedema (fluid retention), hypoxemia, anxiety and depression, risks of sedentary lifestyle and osteoporosis (as side effect of the corticoid treatment).

The 2011 update of the GOLD guidelines [3] acknowledges that acute episodes of exacerbation in patients with COPD constitute a major deleterious factor, negatively modulating several dimensions of the disease, namely: deteriorates patient's quality of

[1] F Luppi, F Franco, B Beghe, LM Fabbri (2008) "Treatment of chronic obstructive pulmonary disease and its comorbidities", ProcAm Thorac Vol. 5. Cited in the EIP-AHA Operational Plan, p. 26.

[2] The TEAMcare Intervention Manual, Managing Depression, Diabetes and Coronary Heart Disease in Primary Care, 2010-2011 University of Washington / Group Health Cooperative

[3] Vestbo J, Hurd SS, Agustí AG, Jones PW, Vogelmeier C, Anzueto A, Barnes PJ, Fabbri LM, Martinez FJ, Nishimura M, Stockley RA, Sin DD, Rodriguez-Roisin R. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD executive summary. Am J Respir Crit Care Med. 2013.15;187(4):347-65

life, increases the use of healthcare resources, accelerates COPD progress, and it has a negative impact on patient's prognosis. Moreover, it has been demonstrated that hospital admissions due to severe episodes of COPD exacerbation constitute the most important factor determining the disease burden in the health system. Consequently, early detection and self-management of COPD exacerbations, as well as policies to prevent unplanned hospital admissions of COPD patients due to acute episodes of the disease, seem to constitute the two pivotal priorities in COPD management.

2.1.2 Burden of the disease

COPD is a highly prevalent chronic condition affecting approximately 9% of the adult population (>45 yrs). In Europe, the disease is mainly caused by tobacco smoke in susceptible subjects. It has a high degree of under-diagnosis (approximately 70%), but it shows an elevated degree of heterogeneity. Organisation of healthcare in COPD patients requires a proper assessment of risk and subsequent generation of stratification criteria.

The disease is currently the fourth cause of death worldwide with a trend to increase during the next years. It is estimated that COPD will be the third cause of disease in 2020. The disease burden on the health system is mainly due to hospital admissions and complications associated with frequent co-morbid conditions, including the highly prevalent non-communicable diseases (NCDs) such as cardiovascular disorders and type 2 diabetes mellitus. COPD is part of the main chronic disorders of the WHO's programme for NCDs which is one of the health priority issues at worldwide level, as shown by the United Nations General Assembly devoted to the topic in 2011[4]. A recent update on the high impact of COPD in terms of deaths, years of life lost, years lived with disability and DALY's has recently (2013) been reported in the New Engl J of Med[5].

2.1.3 Diabetes Mellitus (type 1 and type 2)

Diabetes mellitus type 2 is a metabolic disease characterised by a relative deficit of insulin secretion, that generally increases over time, but never leads to an absolute hormone lack, and that is normally the consequence of a more or less severe insulin resistance on a multifactorial basis. Therefore, diabetes mellitus causes a persistent instability of blood glycaemic level, going from hyperglycaemia (more frequent) to hypoglycaemia.

Diabetes mellitus type 2 represents about 90% of diabetes cases, while the remaining 10% is mainly due to diabetes mellitus type 1 and to gestational diabetes[6].

First usual symptoms for diabetic patient are polyuria (frequent urination), polydipsia (increased thirst), polyphagia (increased hunger) and weight loss. Other symptoms commonly present at diagnosis are: blurred vision, itch and peripheral neuropathy.

Lots of people are not affected by symptoms in the first years, and the diagnosis is made only through routine tests. In the case of too low or too high glycaemic levels, patients with diabetes mellitus type 2 may suffer from hyperglycaemic hyperosmolar nonketotic coma (e.g. very high level of sugar in blood, associated with a decrease of consciousness and hypotension level).

The clinical diagnosis of diabetes mellitus type 2 is normally anticipated by an asymptomatic phase of about seven years[7], during which hyperglycaemia causes

[4] 2011 High Level Meeting on Prevention and Control of Non-Communicable Diseases. General Assembly. New York. 19-20 September 2011. "Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases". Document A/66/L.1. http://www.un.org/en/ga/ncdmeeting2011/

[5] Murray CJ, Lopez AD. Measuring the global burden of disease. N Engl J Med. 2013;369(5):448-57

[6] WHO 2012

deleterious effects at target tissues level, so that at the moment of clinical diagnosis the complications of the disease are already present.

The World Health Organisation recognises diabetes (type 1 and type 2) after the detection of high glucose levels and the presence of typical symptoms. Diabetes can be diagnosed through one of the following:

- Glycaemia on fasting ≥126 mg/dl (on a sample taken at about 8 a.m. after at least eight hours of fasting).
- Glycaemia ≥ 200 mg/dl two hours after 75 g glucose oral consumption (OGTT)[7].

In 2009, an international committee of experts, including representatives of ADA, IDF and EASD, recommended a level of HbA1c ≥ 6,5% to be used for diabetes diagnosis. ADA adopted this recommendation in 2010.

Once the pathology is diagnosed, the most important value to monitor the clinical course of diabetes is the glycosylated haemoglobin (HbA1c). The higher the glycaemia is, the higher the glycosylated haemoglobin levels will be. As the haemoglobin is carried into red blood cells having an average life of 120 days, the HbA1c value reflects the control on glucose levels in the three months before the analysis. Generally, a value lower than 6.1% is considered as normal. The typical HbA1c value in diabetic patients is around 7% or even 6.5%[8].

The persistence over years of moderately high glycaemia levels can in the end cause complications:

- Cardiovascular diseases, for example hypertriglyceridemia and hypertension.
- Diabetic nephropathy that affected 20-40% of diabetic patients; it is the main cause of nephropathy in terminal phase.
- Retinopathy that is strictly correlated to the duration of diabetes and can be considered as the main cause of new cases of blindness in adults aged 20 to 74 years.
- Neuropathy that generally affect distal sensory nerves, altering the perception of vibration, temperature and pain in feet and hands.
- Ulceration that leads to foot amputation.

In-so-far as the disease may lead to the deterioration of other organs, diabetes mellitus type 2 can be considered a chronic disease associated with a life expectancy that is 10 years lower than average.

A certain number of factors correlated to lifestyle are known to be linked to the development of diabetes mellitus type 2, among which are obesity (defined by a body mass index higher or equal to 25 kg/m^2), lack of physical exercise, bad diet (consumption of too many sugars or saturated fats), and cardiovascular risk factors. Moreover, there are people predisposed to the development of diabetes mellitus type 2, for example people with a family history of diabetes and women with previous events of gestational diabetes. In addition to this, there are some drugs that may predispose a person to diabetes. These drugs include glucocorticoids, thiazides, beta-blockers, atypical anti-psychotics and statins.

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[7] "Standard italiani per la cura del diabete mellito tipo 2" – Società Italiana di Medicina Generale, Associazione Medici Diabetologici – Società Italiana di Diabetologia – 2011 Infomedica, Formazione & Informazione Medica

[8] Rossana de Lorenzi, Cristina Gritti, "Verso il primo farmaco ricombinante", European Molecular Biology Laboratory 2007

2.1.4 Burden of the disease

In 2010, about 285 million people in the world were estimated to suffer from diabetes mellitus type 2; this represents about 90% of diabetes cases, and about 6% of the world adult population. Traditionally considered as an adult disease, diabetes mellitus type 2 is now being diagnosed more frequently in children, in parallel with higher obesity rates[9].

Diabetes complications can be extremely disabling, and compromise the functionality of essential organs: heart (myocardial infarction, heart diseases), kidneys (renal failure with the need of dialysis or transplantation), blood vessels (hypertension or other heart diseases, ictus, etc.), eyes (glaucoma, retinopathy, blindness, etc.). Personal and social consequences of diabetes are therefore a progressive loss of personal autonomy and of work skills, reduction of social contacts, more frequent need of assistance at home, and more hospital care. The personal consequences can also include experiences such as: anxiety to get a low blood sugar level; fear of needles; eating disorders in various degrees; depression; anxiety of amputation because of foot ulcers, etc.

The social consequences may include that the person experiences limitations when dealing with others because of the disease. The person may also experience prejudice from other people and therefore have a need to talk to other people diagnosed with the same disease. Good treatment and control of the disease can reduce both the personal and social consequences for the individual[10].

2.1.5 Cardiovascular diseases (CVDs)

Cardiovascular diseases are the largest cause of deaths worldwide[11]. Tobacco smoking, physical inactivity, unhealthy diets, and the harmful use of alcohol are the main behavioural risk actors of CVDs. Long-term exposure to behavioural risk factors results in raised blood pressure (hypertension), raised blood sugar (diabetes), raised and abnormal blood lipids (dyslipidaemia) and obesity. CVDs are largely preventable; population-wide measures and improved access to individual healthcare interventions can result in a major reduction in the health and socio-economic burden caused by these diseases and their risk factors. These interventions, which are evidence based and cost effective, are described as best buys[12]. Although a large proportion of CVDs are preventable, they continue to rise mainly because preventive measures are inadequate.

2.1.6 Burden of the disease

It is reported that more than 17 million people worldwide died from CVDs in 2008. Of these deaths, more than 3 million occurred before the age of 60, and could have largely been prevented. Out of the 17.3 million cardiovascular deaths in 2008, heart attacks were responsible for 7.3 million, while strokes were responsible for 6.2 million deaths. Premature deaths from CVDs range from 4% in high-income countries to 42% in low-income countries, leading to growing inequalities in the occurrence and outcome of CVDs between countries and populations. Deaths from CVDs have been declining in high-income countries over the past two decades, but have increased at a fast rate in low- and middle-income countries.

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9 International Diabetes Federation Data - 2010

10 http://changingdiabetesbarometer.com/docs/Diabetes%20den%20skjutle%20epidemic%20og%20konsekvenserne%20for%20Danmark.pdf

11 WHO, World Heart Federation., & World Stroke Organisation. (2011). Global atlas on cardiovascular diseases prevention and control. Eds: Mendis, S., Puska, P Norrving, B. http://www.who.int/cardiovascular_diseases/publications/atlas_cvd/en/index.html (last checked 4/11)

12 WHO (2011). Global Status Report on Non-communicable Diseases (NCDs). 2010 ed Alwan, A. http://www.who.int/nmh/publications/ncd_report2010/en/ (last checked 23/11)

Major cardiovascular risk factors such as hypertension and diabetes link CVD to renal disease. Of the 57 million global deaths in 2008, 36 million (63%) were due to NCDs (non-communicable diseases) and 17.3 million (30%) were due to CVDs. Over 80% of cardiovascular and diabetes deaths occur in low- and middle-income countries.

2.2 Current management of the health problem (usual care)

2.2.1 Basque Country

Primary care professionals (GP and GP nurse) are principally responsible for a patient's case management, therapeutic / care plan definition, drug prescription, patient training, home visits, and follow-up when the patient is stable. While the communication between healthcare professionals and patient is mainly via traditional channels (f2f, phone), GP and GP nurse can communicate and share information through the EHR and electronic prescription. Additionally, healthcare professionals can exchange patient-related documentation by meeting on a periodic-basis, phone or a social EHR.

Once the patient shows worsening symptoms, but is still out of hospital care (unstable stage), additional healthcare actors take part in the care process. The care manager takes charge of case management, and either he/she or the GP refers the patient to a specialist if necessary. Upon a patient's request, the Deputy Health Service can be activated out of hours, and healthcare professionals can visit the patient at home to perform the clinical interventions required.

The roles that have to be highlighted in hospital care are those of reference internist and hospital liaison nurse. The former is responsible for carrying out tests and diagnostics, defining the therapeutic plan, following up the pharmacological plan, coordinating specialists, informing GP on patient's health status, referring the patient to the long-term hospital (if required), and activating hospital social care team. The latter, in turn, supervises patient's hospital discharge by sharing information with GP nurse, and providing patient with information on therapeutic plan and health education.

On hospital discharge, GP and GP nurse perform an intensive follow-up, including home visits, in order to ensure that patient's health status is not worsening. The GP nurse carries out the patient's integrated frailty assessment; depending on the outcomes, community social services can be activated.

2.2.2 Croatia

Delivery of the field nurse service is organised at the level of primary care setting, and within the healthcare centre at the municipal level. GPs provide primary care services to patients during patient visits to the GP's office, while field nurses deliver healthcare services to those elderly patients who are not able to visit the doctor's office; field nurse service is delivered in patients' homes. The GP and field nurse will meet when needed to discuss a patient's health status, and make appropriate changes in therapy. Those meetings take place regularly, at least once per month or more often if needed. Where field nurses identify a patient's need for the intervention of social care services, they will contact social care, requesting them to take appropriate actions.

The GP will refer the patient to the specialist and/or laboratory if any specific patient examination or test is needed. Based on lab results and specialist feedback and recommendation, the GP will refer the patient for any necessary hospital treatment. The GP is also responsible for prescribing medication to the patient, which can be collected from the pharmacy.

The hospital care is performed by in-hospital specialists and dedicated in-hospital nurses, who take care of the patient. At the point of hospital admission, the patient will be assessed by admission staff (initial analysis, referral to appropriate hospital department

and in-hospital specialist, referring to other specialist if needed, providing the medication plan). Once the hospital treatment process has been completed, a dedicated in-hospital nurse will write a discharge letter which will be given to the patient. Since a central EHR is not yet in place, the patient needs to take the discharge letter to their GP, who will then copy the relevant data into the patient's healthcare record.

2.2.3 Lower Silesia

Stable patients out of hospital care are not supported by ICT. Only face-to-face communication is currently used within healthcare delivery. Care practitioners (GP, specialist, long-term nurse and informal carers) do not currently have any technology to support the care they provide to their patients. GPs and specialists can communicate on a 1:1 basis by phone and/or paper communication. The GP is responsible for continuity of care for patients, and directs them to specialists when necessary.

Care practitioners (GP, specialist, environmental nurse and informal carers) do not have any technology to support their communication when caring for unstable patients. Emergency is the only exception because of ECG transmission to the hospital. Environmental nurses are responsible for specifying needs of patients and execution of daily care provision.

There is no integration of procedures in hospital care. Care practitioners (specialists, nurses, pharmacists, psychologists, dieticians and rehabilitation staff) have access to HIS and LIS/RIS, but these IT systems are not integrated. There is no one login to the systems. Face-to-face is the major type of communication.

Process of discharge preparation is based on paper documentation. Care practitioners of this process communicate face-to-face.

2.2.4 Veneto

The current model focused on assistance of elderly people has three different ways to access services at home. The patient can need a simple ward assistant (= home care worker) or social care intervention, an intervention from the home nursing service, or a more complex home integrated care service. The three services have a different access pathway.

Access to Social Service and Ward Assistance is activated by a request made by the patients, caregivers or the GP, and it follows the pathway represented below.

Figure 1: Veneto: Social Service and Ward Assistance activated pathway

The Home Nursing Service can be accessed in two different ways, depending on the care setting in which the need arises.

If the need of home nursing care arises in the context of a hospitalisation, the service is activated as follow:

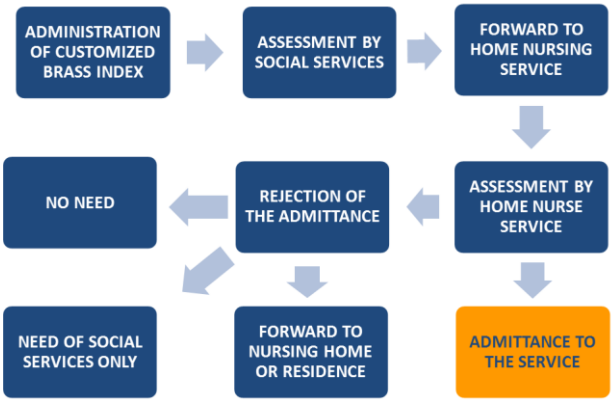

Figure 2: Veneto: Home Nursing Service pathway following hospitalisation

If the need arises for a patient that is at home, the activation of the service proceeds as follows:

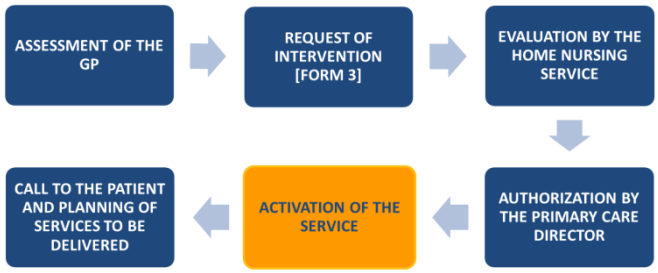

Figure 3: Veneto: Home Nursing Service pathway for patient at home

In the more complex cases where the request is for multidisciplinary intervention at home, the different services involved in the process of care are engaged in an integrated approach called the Multidimensional Assessment Unit, where the multidisciplinary team evaluate the case and decide which services have to be activated to respond to the needs of the patient. In the Multidimensional Assessment Unit, which operates in both primary and hospital care, the team consists of the GP, Director of Primary Care, Home Nursing Service, Social Service, and all the relevant services for each case.

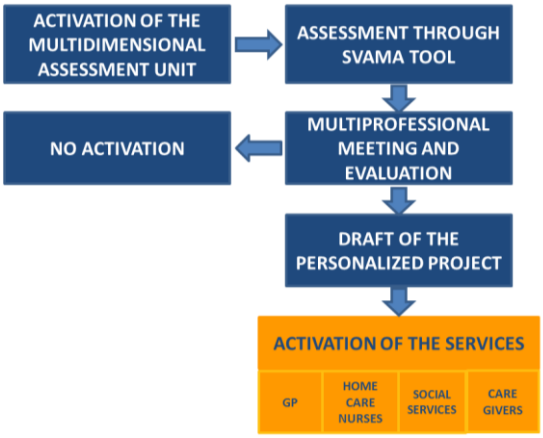

Figure 4: Veneto: Complex home integrated care service

2.2.5 Puglia

According to the guidelines now universally recognised, the Regional Healthcare Agency with the *CARE Program Puglia* is going to take action for the whole Region proposing, with the necessary adaptations, a new model of care based on the Chronic Care Model.

The CARE Puglia Model, implemented since the beginning of 2012, is based on taking care of the patient and their chronic health problems according to the Chronic Care Model with the involvement of all stakeholders, and the introduction of a new professional, a specialised nurse called Care Manager (CM).

CMs provide the patient with tools for self-management of their disease(s). They use a web based decision support system (Information System CARE Puglia Project), and work closely with the patient, GP and specialist, who work as a team (Care Team), to develop an individual care plan to address the problems identified.

A fundamental characteristic of the model is the strong focus on patient / user empowerment which features in all the different phases of treatment, and is supported by appropriate educational processes and coaching. Currently, proactive care is provided for patients with diabetes, heart failure, COPD, cardiovascular disease (CVD) and people at risk of CVD.

Information is shared among healthcare practitioners using a specific web application. This software works by creating specific networking between the practitioners, facilitating the circulation and sharing of the care plan through the creation and dissemination of electronic patient files. This software is being developed to introduce an additional vertical framework - one for each chronic disease.

2.2.6 Powys

Stable patient out of hospital care

If the patient is stable, his/her (and the carer's) contacts with GP / community or specialist nurse are mainly face-to-face or via the telephone. Patients use ICT to access NHS direct, either through the web, or by phone. E-prescription is passed via the GP practice to the community pharmacy where medication is collected in person by the patient or their carer. Patients have contact with social care teams through face-to-face communications or via the call centre.

GPs and nurses liaise to discuss patient care via face-to-face contact, phone or email. ICT is used for electronic referrals from the GP into secondary care via the Welsh Clinical Communication Gateway (WCCG), although its use is still limited, and only in place at some practices. GPs also use the clinical portal to communicate with hospitals.

For the unstable patient out of hospital care, the tool of communication is either face-to-face or via the phone. No ICT is included in this model.

In preparation for the patient's discharge from hospital, the Care Transfer Co-ordinator (CTC) is the key actor in this model. The ward nurse, hospital doctor or discharge liaison nurse meet face-to-face with the CTC to assess and co-ordinate discharge of the patient. The CTC liaises with the social care team to prepare the patient's care package; there is also phone contact with the community hospital during discharge preparation. The CTC has mainly phone contact with GPs, community nurses, community specialist nurses and the reablement team.

There is face-to-face contact between GPs and community nurses (arranging home visits); there is also face-to-face contact between community therapy teams, specialist nurses and reablement teams. Social care teams link with reablement teams regarding care packages and home based reablement.

ICT is used by GPs to send e-referrals via WCCG to the hospital.

2.3 Revised management of the health problem (new care)

2.3.1 Basque Country

Stable patients – out of hospital care

The current service model will be enhanced in a number of ways:

- Wider deployment of the reference internist and hospital liaison nurse into other hospitals in the region.
- Follow-up phone calls by the GP practice nurse on a monthly basis to monitor patient's health status, using a validated clinical questionnaire.
- Further develop the care pathways for frail older people to extend the eHealth Centre to provide improved follow-up / response calls out-of-hours.
- Provide symptom management questionnaires in the Personal Health Folder to further support self-care and self-management.
- Rolling out the electronic prescription to additional healthcare professionals including pharmacists.
- Development of a structured and standard empowerment programme (Kronik ON) for frail elderly patients and caregivers.
- Provision of self-care and self-management educational material through the Personal Health Folder and Osakidetza web portal.

Unstable Patients – out of hospital care

In addition to the above service model enhancement for the 'stable' patient, healthcare professionals will have improved access to near-time information to assist with decision-making when a patient's health status deteriorates. The enhanced role of the eHealth Centre will enable easier continued follow-up of the patient during their recovery period, thus reducing the need for F2F visits.

Inpatient - hospital care

Healthcare professionals in the hospitals will have richer information to understand the nature of a patient's deterioration leading up to their emergency admission, including symptom management questionnaire responses. It is likely that the acuity of patients requiring hospital admission will increase as more patients are able to be managed remotely (by phone calls) and supported in their own homes for minor exacerbations.

Inpatient – hospital discharge preparation

The information on hospital discharge entered into the EHR by the hospital liaison nurse will be able to be viewed by all healthcare practitioners involved in a patient's care team; this will provide a much improved, streamlined and safer service model.

Tailoring self-care and self-management information and education to the individual patient will be facilitated through defining educational material provided to the patient and their family / informal care givers through the Personal Health Folder or Osakidetza's web portal.

2.3.2 Croatia

Stable Patients – out of hospital care

The service model will predominantly be enhanced through the deployment of new ICT, and resultant new ways of working between the GPs and field nurses, social workers (if such need occurs) and patients in the following ways:

- Adaptation and implementation of the Ericsson Mobile Health (EMH) system for support in patient care, used by the field nurses to record the care services that they provide to patients. This information will be immediately available to the GP if necessary.
- The implementation of the EMH system will enable GPs to review a patient's care, and provide advice or a change in a patient's care plan or medication regime through the system rather than having to meet the nurse F2F.
- Field nurses will be able to communicate with the social care workers through the EMH system.
- Patient information to support self-care and self-management will be developed and made available through the EMH system for the nurses to pass on to the patient. This should ensure consistent quality of educational content, and enable information to be updated easily within the system, and new knowledge to be shared.

Unstable Patients – out of hospital care

The EMH system will facilitate the field nurses obtaining additional support and advice from the patient's GP practice if they become 'unstable'; a patient's care plan will be optimised to manage the "deterioration" quicker than is the case currently. The nurses will also be able to provide the patient with additional educational material to help them self-care and self-manage their health and wellbeing during the period when they are considered unstable but not requiring hospital admission.

Inpatient - hospital care

If a patient does have to be admitted to hospital, the GP will be able to provide the hospital with up-to-date information to support the admission and medical history of the patient.

Inpatient – hospital discharge preparation

The introduction of the EMH system will facilitate the discharge of patients, as hospital healthcare professionals will be aware that patients can be more closely monitored in their own homes and be better supported to self-care and self-manage.

2.3.3 Lower Silesia

Stable Patients – out of hospital care

The implementation of the CareWell integrated pathway enables the following developments to the service model:

- Better understanding of the roles and responsibilities of the different care practitioners involved in delivering services and interventions within the care pathway.
- Integrating the hospitalisation of those patients who require it as part of the care pathway to provide better patient care transition experiences across the different sectors and professionals.
- Introduction of telemonitoring for patients who require this service.
- Easier access to healthcare response service for patients through the platform.
- ECR will provide an improved communication mechanism through the email box, and thus enhance the co-ordination of a patient's care.
- The platform will provide a directory of services for patients, family members and informal care givers, as well as professionals, to search for appropriate quality assured health and wellbeing services that are available.

Unstable Patients – out of hospital care

The above enhancement for the stable patient will also be relevant for the unstable patient. In addition, virtual consultations will be able to be activated, if necessary, between the hospital specialists, nurses and GPs via the email box when a patient's health and wellbeing deteriorates.

Inpatient - hospital care

The hospital information system (HIS) is integrated into the ECR; healthcare professionals will have access to the information (anonymised) in the platform if a patient gets admitted. Selected doctors involved in CareWell have access not only to the information in the HIS, but also to the LSV CareWell platform. If the doctor is interested in the information uploaded by the patient, they ask permission from the patient to look at this data. This should provide improved information on the patient's medical history, and the events and care leading up to the hospital admission.

The educational platform in this phase of the project is not targeted at hospital doctors, but they will be able to access the information in the platform if they are interested in it.

Inpatient – hospital discharge preparation

The hospital is able to refer the patient for telemonitoring if they are not already receiving the intervention according to the defined CareWell criteria, and determine their physiological parameters and frequency accordingly. In addition, patients will be signposted to appropriate patient empowerment services and educational content through the platform.

For patients who were receiving telemonitoring prior to their admission, it is expected that they will return to receive the telemonitoring service upon discharge from the hospital.

2.3.4 Veneto

Stable Patients – out of hospital care

The service model underpinning the multi-disciplinary care pathways already implemented in Veneto will be further enhanced in the following ways through CareWell:

- An online patient's 'dashboard' will be created; it will bring together the relevant information from health and social care records, home-care service records, and hospital records. This 'dashboard' will be accessible to all care practitioners involved in a patient's care through a role-based access model.
- The care pathway data collection that informs the multi-dimensional assessment will be enhanced through the patient dashboard.
- Home-care nurses will provide a monitoring service to patients; the information will be shared with relevant healthcare practitioners via the Territorial ICT system.
- The home-care nurses will provide a telemonitoring service, responding to patients entering their physiological measurements and symptom management questionnaire answers into the system.
- The home-care nurses' monitoring systems will include educational material and interventions to assist the patient to self-care and self-manage.
- In addition to the educational material available in the monitoring system, web-based material will be available through the ULSS 2 authority website.
- Patients will be able to access the interactive portal within the ULSS 2 website, where they will be able to provide and receive information about their health and

wellbeing, search for some information in their health reports, download results of tests and investigations, and book appointments.

- The Territorial ICT system will facilitate the sharing of information, care plans, patient monitoring measurements and self-management materials with all those in the care team.

Unstable Patients – out of hospital care

All the above functionality and enhancement to the service model will be available for the unstable patient. It should be possible to respond more appropriately to any deterioration in the patient's condition, as there will be much greater near-time information available to the relevant care practitioners. In addition, the Territorial ICT system will allow GPs to ask for and to receive teleconsultation on patients with the specialist if necessary.

Inpatient - hospital care

Hospital healthcare professionals will have access to the patient dashboard; this should improve the information supporting decision-making in assessing and drawing up the care plan for the patient.

Inpatient – hospital discharge preparation

The availability of the home-care nurses monitoring will facilitate the hospital discharge of a patient. In addition, the continuity of care across the different care sectors will be improved through the implementation of the patient dashboard, together with improved consistency in education material to support the patient to self-care and self-manage.

2.3.5 Puglia

From February 2015, the new organisational model will be put in place and the 100 patients will be followed by integrated healthcare services:

- A Care Team coordinated by a Care Manager will be assigned.
- Therapeutic-individualised care plans will be defined and shared for a better interaction and coordination between GPs, specialists, nurses.
- Care Manager will be responsible for the proper application of the therapeutic-care plan individualised for each patient.
- Care Team operators will rely on the support of Apulia Care Information System for recording, browsing, real-time monitoring and remote consultation of all the health information of the patients enrolled.
- Remote telemonitoring services (for the acquisition and remote transmission of blood pressure, weight, blood glucose, pulse oximetry) will be set up at patient's home by a specific installation team (clinical data will flow into the EHR).
- Specific protocols for vital sign measure and registration will be established and shared with patients to power home data coming from remote monitoring.

CareWell will facilitate the development and implementation of additional care pathways for chronic diseases.

Stable Patients – out of hospital care

CareWell will facilitate the development and implementation of additional services for chronic diseases. Therapeutic recall to improve adherence will be provided together with educational services that can be accessed by patients from a web based platform (Nardino enhancement). Patients will be cared for in a more integrated way by their GP in collaboration with nurses and specialists in outpatient clinics who can share information through the EHR. Specialists will be involved in sharing information through EHR, and to consult and update patient's information in EHR. Messaging and picture sending service (8 a.m. – 8 p.m.) between informal care giver and Care Manager will be

put in place according to a protocol. This can be useful to support the patient in self-care and self-management, particularly in relation to recognising symptom deterioration or improvement, clarification on medications, etc., as well as e.g. monitoring wound healing in a diabetic ulcer.

Unstable Patients – out of hospital care

As with the stable patient, a patient considered to be unstable is cared for by the same team, and benefits from the same new services mentioned above, with an increased frequency of delivery, needing additional monitoring and assessments, frequent adjustments of therapy, or additional counselling. In addition, additional services specified below will be implemented:

- Each health professional involved in delivering the care and support of the care plan, thanks to his own log-in profile, can join a virtual community of health professionals using the online platform to discuss specific clinical problems of their patients.
- Each professional engaged in a patient's clinical management will participate in periodic and planned briefings via videoconference to assess the general clinical status of patients, according to a specific protocol agreed with the quality team.
- Home monitoring will be introduced to measure blood pressure, weight, oxygen and glucose in blood, from devices used by the patients in their homes, interfaced to the Nardino software. All clinical measurements will be uploaded to the EHR.
- Additional consultations / advice through the EHR will be provided according to a defined protocol in response to alerts generated from the telemonitoring technologies.

Inpatient - hospital care

When an unstable patient is unable to be managed at home through the integrated care pathway in primary care, the GP or specialist will refer the patient to the hospital for an admission. When a patient is admitted to a reference hospital, the EHR information will be available to the healthcare practitioners involved in CareWell; this should improve decision making and inform the assessment and care planning process. The integrated care pathway will be enhanced with a more active specialist participation (even the hospital specialist). They will be able to refer a patient who has been admitted to hospital inappropriately to the primary care team, suggesting home telemonitoring, as this has the potential to increase the patient's confidence to self-care and self-manage, and provide the primary care team with additional information for decision support in the event of a patient reporting deteriorating symptoms.

Inpatient – hospital discharge preparation

The stabilised patient is discharged from hospital back to his home. Hospital specialist entrusts the patient to territorial Care Manager, and clinical information for the territorial care team is provided by the EHR. Services for stable patient as above will be provided.

2.3.6 Powys

Stable Patients – out of hospital care

The care pathway and service model for stable patients living with complex needs will be enhanced through the following ICT functionality and associated new ways of working:

- MSDi case finding tool to target CareWell service at patients most likely to benefit.
- Access to the Individual Health Record (IHR) for community nursing and therapy staff through TotalMobile.

- Videoconferencing communication within the community nursing team through Microsoft Lync.
- Community nursing team able to access the GP EHR to record contacts, measurements taken, and care given.
- Comprehensive directory of health and wellbeing services available for patients in Powys through the Info Engine.
- Community nursing team will provide a telemonitoring service in response to patients taking and uploading their own physiological measurements at home.
- GP practice websites to include chronic conditions management educational content to support patients to self-care and self-manage.
- Patients will have access to My Health Online where they will be able to view a subset of their GP EHR, book GP practice consultations, order repeat prescriptions, and update their demographic details if necessary.

Unstable Patients – out of hospital care

All of the above functionality will be available to support improved team working and response services for patients who experience deterioration in their health and wellbeing.

Inpatient - hospital care

Healthcare professionals in the community hospitals will have richer information to understand the nature of a patient's deterioration leading up to their emergency admission, including telemonitoring information and any symptom management questionnaire responses. It is likely that the acuity of patients requiring hospital admission will increase, as more patients are able to be managed by telemonitoring and support in their own homes for minor exacerbations.

The use of TotalMobile and Microsoft Lync by the community nursing team will facilitate improved communication between the team and community hospital staff.

Inpatient – hospital discharge preparation

The availability of the community nursing team's telemonitoring service will facilitate the hospital discharge of a patient. In addition, the patient will be signposted to the relevant chronic conditions management educational content on the GP practice website, and any additional support services available from searching the Info Engine.

2.4 Technical characteristics of the application

Full details of the CareWell ICT-enabled service specification and IT architectures can be found in deliverable D4.1 Pilot level Service Specification for CareWell service. The following section provides an overview for each site.

2.4.1 Basque Country

The Basque Country has made a number of changes to improve their services:

- Integration of hospital pharmacy data into the EHR.
- Integration of systems to provide the EHR in a single system for both care sectors (primary and secondary care).
- Integration of the clinical information from the CareWell chronic programmes into the EHR.
- Improve the Business Intelligence to provide new functionalities for patient stratification.
- Development of an educational web platform for patients.

The new systems or functionalities are:

Integration of hospital pharmacy data into the EHR

The e-Prescription service in secondary care will be extended to include primary care with a shared database. This will be achieved through the deployment of several web services designed to recover and upload data to the central e-Prescription database irrespective of whether the prescription request is made from the module in the primary or secondary care IT system.

System integrated of both primary and secondary care EHRs

The interface of the application integrating both EHRs is equal to that used in secondary care. The major challenge, therefore, is the implementation of this application in primary care, where practitioners can be reluctant to use new applications. In order to avoid this situation, a contingency measure has been established which defines a progressive functional adaptation for primary care users. This plan outlines how the functional modules only present in the primary care EHR can be gradually added to the new application, although the interface visualisation will be slightly different.

Development and standardisation of the data collection to automate the risk stratification score calculation

The independent variables needed to calculate the risk stratification score developed in the Basque Country come from several administrative and clinical databases (hospitalisation, emergency visits, consultation, prescription, diagnosis, demographic data, etc). All this data needs to be linked at patient level. During the CareWell project, a Data Business Warehouse has been developed which allows data to be collected from several databases in a standardised way.

Through this data collection process, the prediction risk algorithm is applied manually, and the outcome of the risk stratification at patient level is uploaded into the EHR.

The risk stratification score is used in the CareWell pathway to identify patients with high complex needs who are most likely to benefit from the CareWell pathways and services.

Develop a new educational web

New educational materials and documentation have been added to the Basque Health Service's web portal. There is a specific section in the portal called 'Health School' where distinct content aiming to foster patient / caregiver empowerment are described:

- Actions in case patient health worsened.
- Healthy lifestyles.
- Information about your disease.

2.4.2 Croatia

The main challenge for Croatia pilot during CareWell has been to develop and deploy the architecture required to deliver the patient empowerment and home-support services pathway. The core of this architecture is Ericsson Mobile Health system for support in patient care.

For this activity, the EMH has several adapters and viewers that enable it to run on several platforms such as tablet, PC or TV (Smart TV).

The Croatian pilot focused on the following technological developments:

- To adapt and deploy to a pilot population the EMH system consisting of a number of modules to support chronic conditions management and the provision of digital educational tools for patients.

- To integrate the telemonitoring data from the EMH into the GP patient record within the GP application (G2).
- Develop and implement the Home Health Smart TV viewer to enable patients and informal caregivers to access the telemonitoring data collected by the field nurses using EMH.

Ericsson Mobile Health system for support in patient care

This is a platform to provide remote health services, applicable for various use cases in healthcare, self-care and wellbeing, to be implemented for the purpose of CareWell project. EMH will receive input from physiological measurement devices and record the data into the PHR, which will be viewable on the android application running on a tablet or Home Health Smart TV. This data will also be sent to G2 (GP office applications).

The roles able to use EMH will be GP/Nurse, Field Nurse, Social Care Worker, Caregiver, and Patient.

FER Home Health Smart TV

FER Home Health Smart TV provides easy access to the valuable EMH data to patients. The system consists of two main components:

- FER Home Health TV application.
- Adapter service

Using the carefully designed application, patients and their caregivers can access and view their medical data such as medical measurements, warnings and messages, and educational materials provided by medical experts. For the purpose of Croatia pilot, FER Home Health TV will enable only one role – patient. In order to improve the interoperability of FER Home Health TV system, the adapter service is designed and integrated. The advantage of adapter service is that it would be easily installed in other CareWell pilot sites if there was interest.

2.4.3 Lower Silesia

As Lower Silesia currently does not have many IT systems implemented to support the delivery of care or share information, both CareWell pathways will be significantly improved with the proposed ICT-enabled services and functionality. The LSV telecare procedure concerns patients aged between 65-85 years with at least two chronic diseases including hypertension (ICD I10), diabetes (ICD E 11), COPD (ICD J44) or heart failure (ICD J50).

The development of a platform to provide interoperability between the different IT systems used in primary and secondary care will enable information to be shared between the different care practitioners and patients. The new systems or functionalities are:

- Registration of patient referrals for home care telemedicine (TOP). This is the first task in the process of LSV teleCare.
- Registration of performed patient results in HIS Portal.
- GPs access to EHR and their own tasks supporting the process of LSV teleCare procedure.
- Nurses access to the EHR, and their task or process that supports the LSV teleCare procedure.
- Patients access to their own PHR tasks supports the process of LSV teleCare procedure.
- Implementation e-Prescription in SIM (P1) during the LSV teleCare procedure.

- Call Centre staff access their own tasks supporting the LSV teleCare procedure process. Receive e-mail and SMS alerts.
- Doctor, nurse and patient access the Information and Education Portal.
- Call Centre staff access the Information and Education Portal.
- Some of the developments and changes will revolve around the new interoperability platform Integratis.

2.4.4 Veneto

The most important challenge for Veneto pilot during CareWell is the evolution and the integration the EHR in primary and secondary care. This integration is possible due to extending the use of Territorial Information System to secondary care and to GPs.

This challenge is not only the number of users; this challenge represents others problems to resolve such as:

- To implement new roles of users.
- To implement the functionalities foreseen within CareWell.
- To share information among services and levels of care.
- To develop new interoperability connections.
- Major risk of data duplication and incremental cost of support and management.

The Territorial ICT System has been upgraded and enhanced with new tools and modules. It has mainly involved:

- Development of the patient dashboard that collects and aggregates the information about the patients relevant for the integrated care delivery. The dashboard called "Fascicolo Territoriale" contains data such as services, assessments, diagnoses, evaluations, and other relevant information.
- The creation of an assessment module in which has been inserted the complete electronic workflow for all the professionals involved in the multidisciplinary assessment of the patient (GP, Director of Primary Care District, home care nurse, social worker, specialist if required).
- The enhancement of the Home Care module with the development of new features such as the telemonitoring for nurses and GPs and the teleconsultation between GPs and specialists.
- Development of the mobile app used by the nurse during service delivery at the patient home.

The patient empowerment and home-support services pathway includes the following IT architecture developments:

- Develop interactive functionalities such as search for some information in their health reports, download results of tests and investigations, and book appointments.
- Develop educational materials to be shared in the web site.

The activation / deployment of the services foreseen in CareWell have led to changes to the architecture of the Territorial ICT System.

2.4.5 Puglia

The new systems or new functionalities are:

- During the CareWell implementation, the CARE Puglia Program platform will be enhanced to support new service delivery, and will undergo many technical adaptations.
- A new clinical profile will be created to allow specialists to access the EHR and share information with the Care Manager and GP. A new user role will be defined giving them the possibility to update information on patients and consult information uploaded from other members of the care plan. The platform is fully compliant with DICOM 3.0 standard, so CARE Puglia software will integrate with PACS for management of all forms of diagnostic imaging to implement specific work flow or process a second opinion, or in general, to support specialised activities.
- Technological adaptation will be provided to create an interface between the telemonitoring device hub software (at patient's home) and Care Puglia software, and to create conditions for the platform to receive clinical parameters from home monitoring; platform adaptations are also necessary, and they will be provided to send therapeutic recalls toward Hub; it will also be enhanced to support the release of educational tools for patients and their informal caregiver (by their own PC), and to upload images coming from messaging service between patients and Care Manager. Technical interventions both on platform and Hub software will be set to create a warning on the platform for out-of-range clinical parameters revealed by home devices.

2.4.6 Powys

The most significant changes in the IT architecture are those to deliver the patient empowerment and home-support services pathway. The services and ICT solutions that will be deployed and utilised to support the delivery of these integrated care pathways are shown in the diagram below, which represents an update to that presented in deliverable D4.1.

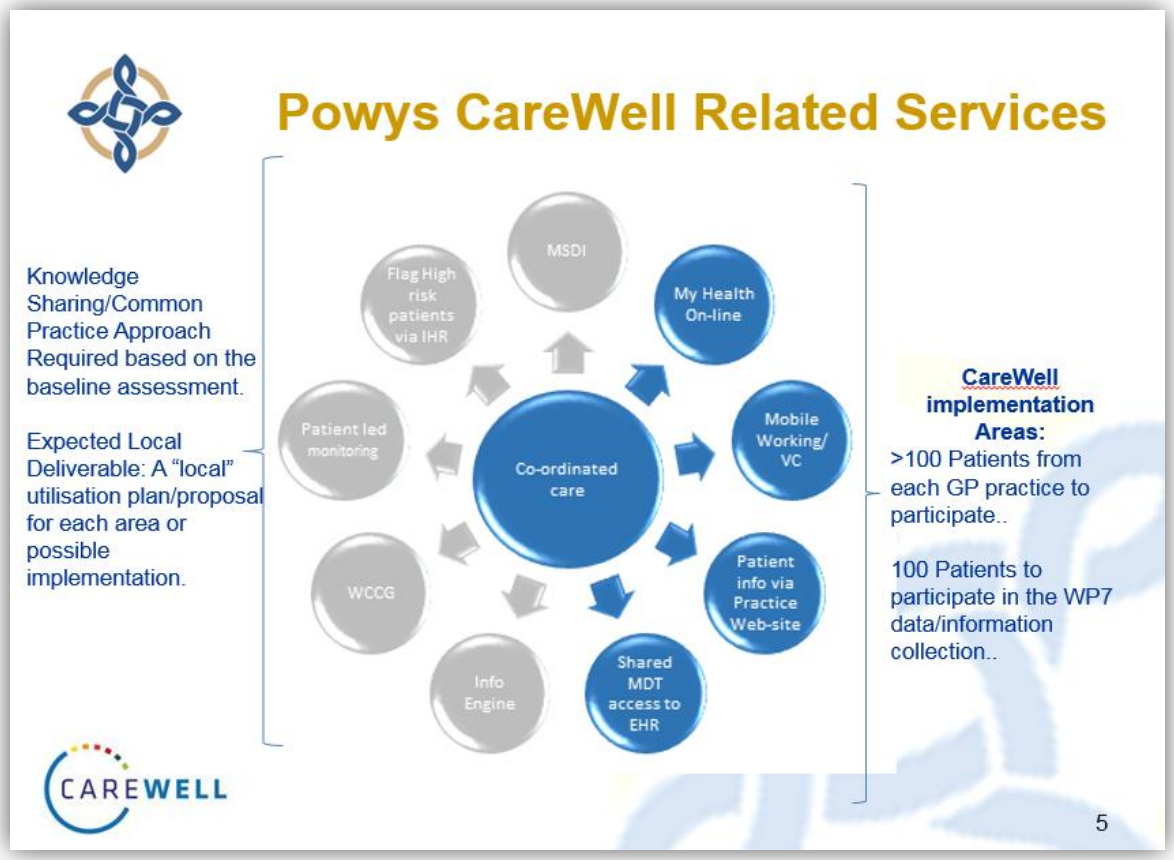

Figure 5: Services and ICT solutions deploy in Powys

Changes or new systems (pathway empowerment and home support):

- Mobile app to access EHR: The current and newly developed systems will be adapted to run on mobile devices such as Smartphones and tablets for the district and specialist nurses to use when they make visits to patients' homes.
- Implement a telemonitoring service.
- Develop a single database with social and clinical information for community services which is currently undergoing a national procurement.
- Educational materials and information available on GP practice websites.

The integrated and coordination services pathway will be enhanced in the following ways:

- Implement inter-consultation message (referrals) through EHR between clinicians.
- Implement live communication tool between community nurses and GP.
- Implement videoconference.

2.5 Requirements for the use of the ICT solution

2.5.1 Basque Country

The Basque Country's ICT system has been improved with new services to achieve a better coordination among healthcare professionals and provide patients and caregivers with clinically validated educational material for self-management.

The introduction of these services has required distinct training sessions for the healthcare professionals involved in CareWell. The training has included information on:

- Clinical aspects of the different pathologies frail elderly patients can suffer from (diagnosis, symptoms, management etc).
- The clinical questionnaire GP practice nurses have to ask patients on a monthly basis.
- Description of the extended roles of the reference internist, hospital liaison nurse and eHealth centre nursing.
- The content and methodology of the new structured empowerment programme.
- Handling the educational platform embedded in the web portal.
- Procedures to gather and register all the information required for the project evaluation.

2.5.2 Croatia

To run the ICT solution needed for the delivery of the CareWell service in Croatian pilot site, the following requirements need to be satisfied:

1. Application server h/w and s/w configuration.
   - HW -> min. 2 CPU-a i, 4GB RAM-a, 1GB HDD.
   - SW -> Linux OS, MySQL database SW licence (standard edition subscription).
2. Ericsson Mobile Health system s/w licences:
   - EMH Backend system s/w licence.
   - EMH Patient licence.
   - EMH Android application s/w licence.
3. Communication link:
   - wired broadband connection link, 1 Mbit upload and download.
4. Healthcare staff equipment:
   - GP office PC with broadband internet connection.
   - Android based tablet for field nurses.
   - Android based Smartphones for patients.
   - SIM cards with mobile data plans for tablets and smartphones (512MB monthly plan).
   - Bluetooth enabled medical devices for field nurses, one set per nurse: blood pressure monitor, pulse oximeter, spirometer, 12-Lead ECG.
   - Consumables for medical devices: ECG electrodes, personal filters for spirometer, 1.5V batteries.

Apart from the basic requirements to run the system, EMH system must be integrated with the standard GP office application:

- to secure the interoperability;
- to simplify the field nurse created data analysis process;
- for the GPs to use one application in everyday work instead of two.

Training is needed for the following actors to secure the service delivery quality:

1. EMH System administrator:
   - Knowledge transfer on how to administrate all parts of EMH system (Backend and Android).
2. GP:
   - Explain the new service flow introduced within the CareWell.

- EMH Web application training for data access (backup option) and how to access the CareWell data through their standard GP application.

3. Field nurse:
   - Explain the new service flow introduced within the CareWell.
   - EMH web application training for data access.
   - EMH Android app training (tablet and smartphone).
   - FER Home Health smart TV application.
4. Patient and caregiver (training provided by field nurses):
   - Explain the new service flow introduced within the CareWell.
   - EMH Android app training (smartphone).
   - FER Home Health smart TV application.

According to the experience from the first four months of the operational pilot phase, we have learned that 60% of field nurses included in the pilot have adapted to the use of the ICT in the four months of operational pilot phase. Our expectation is that by the mid-term we will have the 100% adaptation of field nurses to the use of ICT.

2.5.3 Lower Silesia

It is important to enable patients to benefit from telecare services in a safe way that they can understand. Facing the problem of an aging population and the fight against social exclusion, it becomes increasingly important to educate the public, and create the opportunity for people to learn about and understand the model of telecare and the benefits it brings. The most important task, as well as the most difficult one, is to educate patients to make them aware that the use of telecare increases their safety and a quality of life. Confronted with the standard model of healthcare, telecare give them more benefits. Social portal functionality also means to patients an easy access to their care history (of the disease), the possibility of being kept informed with their results, and the feeling of having more control over the process of healthcare.

2.5.4 Veneto

In order to deploy the services described and forecast in CareWell the ICT infrastructure had to be updated and upgraded.

The Territorial ICT System has been upgraded and enhanced with new tools and modules. The system is web-based, and therefore does not require any special premises or installation, neither for GPs nor for the other professionals involved.

It has been necessary to replace old palm held devices with smartphones, and acquire the devices used by nurses to measure and monitor clinical parameters. The devices are:

- Sphygmomanometers;
- Pulsoximeters;
- Glucometers;
- Coagulometers;
- Weight scale.

2.5.5 Puglia

Training sessions for patients, formal and informal care givers will be carried out on use of devices, according to the protocols.

ICT components to be procured are digital and wireless devices such as:

- Glucometers.

- Medical weight scales.
- Sphygmomanometers.
- Pulse oximeters.

2.5.6 Powys

The services that are being deployed under this integrated care pathway are being done so through the deployment and utilisation of existing and available ICT software solutions to NHS Wales. Therefore the requirements for use of these services are broken down into two distinct categories:

- NHS Wales (Internal Hardware/Resources): This is inclusive of the service / operational model that has been deployed across NHS Wales and is not solely used / available to Powys THB but to all NHS bodies (where applicable). The use and utilisation of this hardware, specifically in terms of the integrated Care Pathways and services being deployed are "built" into existing support arrangements between NHS Wales (inclusive of Powys THB), NWIS and local ICT directorates.
- Requirements for use by "End Users" i.e. patients: This relates to the ICT requirements for end users / patients to access the ICT related services detailed in section 2.3.6 above being deployed to patients to support our Integrated Care Co-ordination and Patient Empowerment. The services that Powys Teaching Health Board are/will be deploying to patients (i.e. those that are accessible to patients) will all have a web enabled user interface. On that basis the ICT requirements of the users are limited to access to the World Wide Web, web browser and device that supports the use of internet access/web applications (e.g. Desktop PC, Laptop, Tablet, Mobile Device).

2.6 Requirements for Integrated Care Model implementation

2.6.1 Basque Country

In the case of the Basque Country, the new pathway has been designed by the managers and clinicians of both the hospitals and the primary care centres involved in the programme. This is essential for the implementation of the model in a proper way, meaning that all stakeholders' perspectives have been taken into account, and a clear methodology in the design the intervention has been carried on (analysis of current model, detection of improvement areas, prioritise actions and define the new care pathway). Moreover, the objectives of the CareWell project are totally aligned with the strategic plan of the central organisation of the Basque Country health system (Osakidetza).

The new model has been presented in several meetings to the GPs, nurses and specialists who are principally responsible for patients' case management. The professionals from primary care and secondary care now have new and better channels of communication to share information about the patient before, during and after delivering their services.

Since primary care nurses are the ones responsible for the empowerment of the patients, some nurses in charge of chronic patient have developed the new educational material for the educational platform. After all the material and the methodology were developed, these nurses trained their colleagues in peer training.

2.6.2 Croatia

Since the new, adapted service provided in CareWell project is mostly based on the existing field nurse service, we will not have the need to introduce new premises for the implementation of the integrated care model.

The service is taking place in two settings, GP office and patient home. Field nurses are doing patient visits in their home during which certain activities are being performed: collecting patient data (questionnaires and medical measurements), and educating patients on healthy living and prevention methods for the specific disease area.

All training needed for GPs, nurses and patients / caregivers, are described in section 2.5.2.

2.6.3 Lower Silesia

The first step in implementation of telecare is suitable qualification of patients, and then, depending on its outcome, configuration of the appropriate telecare procedure. This is important because the process of telecare which is implemented in the system, described crucial flow of information and tasks, but does not define how various steps have to be performed by individual patient.

The telecare process of the Lower Silesia CareWell System assumes that at fixed intervals a patient will perform life parameters measurements at home and the results will be transferred to a healthcare unit. In contrast to the old style home care, the telecare results have to be checked by a doctor who has to determine what specific tests and at what intervals the patient should do them. During the process, there may be a need to change some details such as measurement intervals.

The results of the patient's measurements flow into the central system, where algorithms analyse the results and examine whether they exceed thresholds, and check if their behaviour is similar to that expected. If there is a departure from the norm, a task appears in the system for hospital staff, in our case a nurse, to analyse these results. Her task is to verify whether the test was carried out in a correct way, whether the patient may have taken any medicine responsible for the distortion of the results, or if his behaviour affected their values (e.g. increased physical activity). When the observed anomaly is an erroneous measurement or it is caused by human error, the patient is recommended to repeat the test. If it is a worrying signal which may endanger the patient's health, a nurse can contact a doctor or intervene immediately by calling an ambulance to the patient.

Another phenomenon in telecare procedure is an intervention, which we understand as a situation caused by an undesired phenomenon (e.g. accident) or is a significant deviation from the standard implementation of the procedure. The incident may be reported by the patient in two ways. First, the patient can use the supplied phone number to call the Call Centre (in the hospital conducting this procedure), where he can obtain help from a nurse; in some situations, a nurse may consult with a doctor; she can also arrange a home visit earlier, or in special situations call an ambulance to the patient. Second, the patient calls the emergency room directly; then he is admitted to hospital following standard procedures; after discharge, the patient record is supplemented with an extract from hospital.

In the course of the procedure there are also anticipated periodic visits by a nurse in the patient home. Normally this is done once a month. Although in case of incidents appearance, their frequency can be increased.

Once the telecare goal is reached, a patient visits a doctor, who may decide to continue the treatment or end the procedure. In the case of telecare procedure termination, there is generated an automatically record of results and doctor prepares a detailed report for the whole period covered by telecare.

2.6.4 Veneto

In the case of Veneto Region's Local Health and Social Authority nr.2 of Feltre, the most significant part of the change has related to the technological infrastructure: these changes have therefore led to modifications to the organisational model underlying the delivery of integrated care.

The professionals now have new and better channels of communication (other than paper, fax or phone) for sharing information about a patient before, during and after delivering their services:

- New channel of communication will improve and enhance the team work of the GP, nurses and other professionals involved in a single case.
- The specialist will devote part of his time to new ways of consulting with GPs and assessing the patients.
- GPs will be able to monitor their patients, especially those in not stable conditions at home, in cooperation with the Home Care nurse.
- Nurses will have new tools and ways to assist the patient at home, and will play a fundamental role in the coordination and exchange of information. This will also strengthen the relations between nurse and GP and vice versa.

To do this, it is absolutely important to give proper training to all the professionals.

The training is carried out starting with meetings dedicated to single professional categories, in order to show and acquaint them with the new system. After this first stage, a second wave of meetings for multidisciplinary teams is carried out.

2.6.5 Puglia

In Puglia, an integrated approach to patients with complex needs has existed since 2012 (Care Program).

GPs and Care Managers are involved in populating the EHR, and using it for inter-consultations. The Care Manager has an important role in pathway coordination and support patients empowerment.

ICT tools are available to support integrated approach: the Care Program software – Regional health information system.

The patient is selected for enrolment in the CareWell programme by either a GP or specialist after a complete medical examination. During the examination, the clinician informs the patient about the Disease and Care Management programme, with explanations of the pathway, the advantages / disadvantages, and the envisaged holistic approach. The patient is then asked to sign an informed consent form for inclusion in the programme and use of their data. The patient is then referred to the Care Manager (CM specialised nurse) to be formally enrolled.

After enrolment, the CM completes the initial assessment in a face-to-face interview, using information already present in the GP's / specialist's data base, and answers given by the patient; software supports the CM in collecting information about the patient by opening specific interfaces containing questionnaire on lifestyle and socio-economic condition. Based on the initial assessment, the GP / specialist and the CM define the patient's care plan, and share it with the patient so the patient can provide input. The GP / specialist identify the degree of complexity of the patient in terms of care load required, and then tailor / focus interventions. The care plan is then used to plan the workflow of all relevant healthcare professionals. The GP has access to all documents of the patient through CarePuglia. Where necessary, specialist consultations are requested using specific and dedicated booking systems to ensure the patient receives tests / examinations in line with an appropriate schedule which is defined according to the related protocols. The CM coordinates the whole care management process, ensures the

care plan is carried out, and through direct interaction with the patient constantly monitors adherence to care plan and therapy. The CM is also responsible for delivering coaching activities which seek to provide:

- Information.
- Motivation.
- Support / empowerment.
- Health education and self-management.

Therefore the patient becomes empowered, learns how to cope with his own condition, becomes pro-active and responsible, and is aware of how his involvement and commitment in managing his condition can improve his overall clinical condition and his quality of life.

Each step of the Disease and Care Management process is registered in the EHR via the digital platform. Information uploaded via the digital platform is included in a database which is at the disposal of the entire care team, and can be used to better orient care processes and the patient's coaching.

The CM conducts periodic questionnaires in face-to-face interviews with the patient to update the assessment of the patient's condition. From this the care plan is modified accordingly. Coaching of the patient will then be updated to reflect these changes; if necessary, an appointment is made with the GP or the specialist in order to modify the therapeutic plan.

The CM will also collect patient measurements such as their weight, the size of their waist, etc. These measurements are collected every six months, and are used to follow the development / improvement of the patient's health status. Over time, the number of assessments will decrease if the care plan is effective and the patient's measurements / health status improves.

2.6.6 Powys

The CareWell Integrated Care Model for Powys Teaching Health Board has been designed based on use of ICT and services that already exist within Wales, and is aimed at deploying these services to patients of Powys via health professionals in general practices and primary care,. The model has been presented to all stakeholders in various forums within the organisation, and specifically to the project board and team who report to senior directors and executives within the organisation. We have also communicated to patients via GPs and via telephone and written communications; we have plans in Powys to hold user group forums with our cohort in the new year.

Training of stakeholders in the use and development of these chosen services is carried out in a number of ways: by the service providers, healthcare professionals and the project team. It is supported by (at this stage) hard copy training materials, with a view to producing e-learning materials if the need increases as expected.

The services being deployed will be used either at the GP practice, at the patient's home, or though mobile devices / tablets made available to the healthcare professionals. The services being deployed in Powys are (in the majority of cases) web based, and therefore are accessible from any location with a valid internet connection and web browser enabled device.

2.7 Summary

2.7.1 Integrated care coordination pathway

- Better communication between healthcare professionals (primary and secondary care): interconsultations via EHR (Veneto), videoconsultations (Veneto, Powys), virtual space within EHR to discuss patent's health status (Puglia), ICT system integration (GP office and central healthcare system) (Croatia), wider deployment of reference internist and hospital liaison nurse roles (Basque Country).
- Better definition of care manager role (Puglia).
- Improved information sharing between healthcare professionals via central storage of data and definition of shared care plans. Distinct ICT systems are used: EHR (Basque Country, Powys, Puglia).
- Smooth transition support by facilitating information sharing after hospital discharge using ICT systems (Lower Silesia, Powys).

2.7.2 Patient empowerment and home support pathway

- Promote patient and caregiver empowerment through access to health related educational material. This material is provided via online platforms (Croatia, Veneto), Personal Health Folder (Basque Country)
- Patients can access or enter clinical information and book appointments via distinct ICT tools: Personal Health Folder (Basque Country), My Health Portal (Veneto), My Health Online (Powys)
- Messaging between healthcare professionals and patients/caregivers via Personal Health Folder (Basque Country).
- Remote monitoring of patients' health status via telemonitoring, mainly led by nursing (Croatia, Lower Silesia, Veneto, Puglia, Powys), phone calls (Basque Country), questionnaires in online platforms supervised by healthcare professionals (Basque Country), teleconsultations (Veneto).

3. Domain 2 and 3: Safety, clinical and social effectiveness

3.1 End Users

3.1.1 Basque Country

In the Basque Country, the population is stratified using a risk assessment method based on John Hopkins ACG PM (Adjusted Clinical Groups Predictive Model). The tool included several risk factors: demographics, clinical diagnoses (Dx coding), medication utilisation (Rx coding), and prior healthcare costs. The output of the risk assessment is a risk score (IPR: Risk Prediction Index) that is used to allocate patients into four different strata: 'case management', 'disease management', 'self-management support' and 'prevention and promotion'.

According to the stratification tool, 32.000 patients are identified as patients with multiple comorbidities ('frailty'). Following the stratification tool results and the inclusion criteria of CareWell project, 200 patients have been identified and recruited by their GP in five different integrated healthcare organisations of the Basque Country: OSI Bilbao-Basurto, OSI Uribe-Cruces, OSI Tolosaldea, OSI Galdakao-Barrualde, and HUA. Data for 10.000 patients will be included in the predictive modelling exercise.

3.1.2 Croatia

The recruitment of patients was undertaken at primary healthcare polyclinic Zagreb City Centre.

The Polyclinic covers 350.000 patients of the city of Zagreb, which makes around 300.000 primary healthcare examinations and 200.000 secondary healthcare examinations. Although the Polyclinic is of primary healthcare, secondary healthcare is also available such as pulmonology, cardiology, women's health.

The plan was to recruit around 50-60 patients for control and for intervention group.

For the purpose, six GPs were selected based on their coverage of patients, and among them patients were recruited based on the study protocol (indications, presence of care giver, etc.).

3.1.3 Lower Silesia

In Lower Silesia, 100 patients were selected based on Clinical Guidelines. All patients assessed for eligibility are current patients of A. Falkiewicz Hospital (for integrated care model) and Outpatient Clinic (for usual care model). The average number of patients is similar to data from 2014.

In 2014, the following were admitted to the A. Falkiewicz Specialist Hospital (45 geriatric beds):

- 168 Diabetics patients.
- 35 COPD patients.
- 416 Hypertension patients.
- 231 Heart failure patients.

The Hospital serves patients as a one of five municipal hospitals in Wroclaw City, with a population of 600.000 inhabitants.

In 2014, cooperating outpatient clinic had patients:

- 655 Diabetics patients.
- 40 COPD patients.
- 2.268 Hypertension patients.
- 47 Heart failure patients.

3.1.4 Veneto

Regione Veneto has been deploying in the Local Health and Social Authorities the Johns Hopkins University ACG System for the stratification of the population since 2013. This tool assesses the health status and risk of the population and individuals using socio-demographic data, clinical diagnoses, drugs prescription and consumption, information on hospitalisation, emergency room admissions, outpatient visits, and other services delivered; in addition, it takes into account the consumption of resources.

The ACG analysis is carried out on an annual basis; it allows stratification the population and identification of patients with high risk; it is used by the Local Health and Social Authorities to plan actions and interventions on specific target sub-populations according to different conditions and needs.

For the CareWell project, the stratification of the population at 31st December 2014 has been used in the Local Health and Social Authority nr. 2 of Feltre to identify eligible patients according to the inclusion criteria defined in WP7 (n=3.893). From this sub-population, a cohort of frail patients who have already received at least one home care intervention during 2014 has been identified (n=726). The lists of patients were handed to GPs for recruitment in order to reach the planned sample in the intervention group (n=80) and control group (n=80). Data for 3.000 patients will be included in the predictive modelling exercise.

3.1.5 Puglia

The inclusion criteria are:

- ≥ 65 years old.
- Two or more chronic diseases included in the Charlson Comorbidity Index. At least one of the comorbidity conditions should be: COPD, heart failure, or diabetes mellitus (both insulin dependent and non-insulin dependent).
- Patient must meet the local, national or international frailty criteria: complex healthcare needs, a high risk of hospitalisation or home care, increase in vulnerability.
- The patients who are going to be provided with telemonitoring devices must be able to use them (by themselves, or with their caregivers).

Exclusion criteria:

- Subjects who have either been registered with an active cancer diagnosis under treatment, have undergone an organ transplant, or are undergoing dialysis prior to enrolment.
- Subjects who are candidates for palliative care (with life expectancy less than one year, clinically evaluated).

The GP or the Care Manager / GP nurse will review the EHR of their patients in order to identify candidates who meet the inclusion criteria. If a potential candidate is identified, an appointment with the GP will be organised. The GP or the Care Manager / GP nurse will explain the intervention to the patient. If the patient accepts, he/she will have to sign the informed consent form. Patient recruitment started in February 2015, and ended in September 2015). 200 patients will be evaluated, 100 in the intervention group and 100 in the control group.

The service added to the CareWell organisational model performed in Puglia implied the remote monitoring of vital signs / parameters. Data for 3.000 patients will be included in the predictive modelling exercise.

3.1.6 Powys

Patients participating in the CareWell project in Powys all meet the criteria set in D6.1: they are aged 65 or over, and suffer from a chronic disease along with other conditions set in the evaluation. Only those patients meeting the criteria have been approached in Powys. We have a variety of information systems available in NHS Wales and Powys; these have allowed us to narrow down the patients that we identify and approach to those specifically meeting the criteria set. That however does not negate some patients who have declined to take part, nor those who have since deceased (see above enrolment process).

The patients in Powys can expect direct access to three distinct services as part of our delivery model:

- Website information: this will provide them with "trusted" sources of information and support mechanisms in relation to their condition.
- MS Lync: this will provide GP practices with the ability and added functionality to hold and participate in mobile working.
- Video Conferencing facilities between care providers, My Health Online: this will enable patients to manage their healthcare information online linked to GP systems, and enable them to manage their repeat prescriptions and appointment bookings online.

The scope of the use of My Health Online has been restricted to these two key aspects of functionality; however, there is a continuous development cycle for this product, and future features may be used post the CareWell project. Patients can also expect to benefit from six other areas identified through the local project, but these will not be "front" facing solutions that the patients can access, and therefore their benefits will be indirect.

The care will be deployed and implemented by the project team with ultimate care being provided through existing pathways, general practices, and care providers in Powys and Wales.

Access to these services will vary dependent on which of the three is used by the patients: My Health Online and the website information will be available 24/7. However the use of MS Lync will be determined for use by the GP practices as they see fit and suitable for each case. 102 patients have been recruited.

3.2 Objectives

The overall aim of the evaluation carried out in CareWell is to identify the differences introduced by implementing ICT supported integrated healthcare in different domains according to the MAST evaluation framework [2], including safety and clinical outcomes, resource use and cost of care, user/carer experience, and organisational changes.

The main focus of the evaluation will be the impact of so called "vertical" integration, that is the integration of services delivered between primary healthcare, secondary healthcare and the third sector (voluntary sector), and changing organisational models for the frail elderly patient.

3.3 Enrolment flow charts

3.3.1 Basque Country

Flow-chart filled out: January 2016.

The recruitment carried out: From June 2015.

Professionals in charge of the recruitment: GPs.

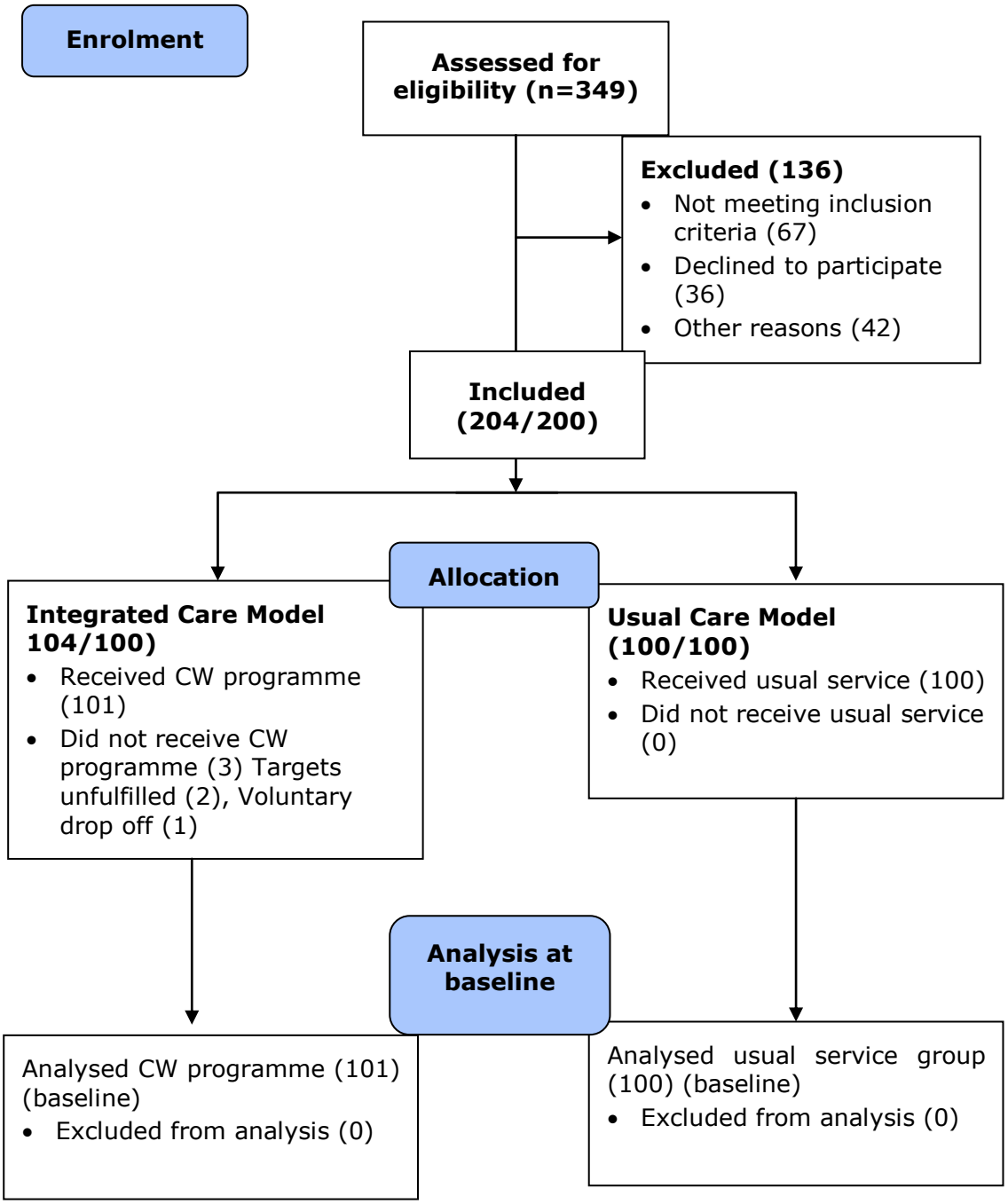

Figure 6: Basque Country: Enrolment flowchart

3.3.2 Croatia

Flow-chart has being filled out: January 2016

The recruitment has been carried out: January-May 2015

Professionals in charge of the recruitment: GPs

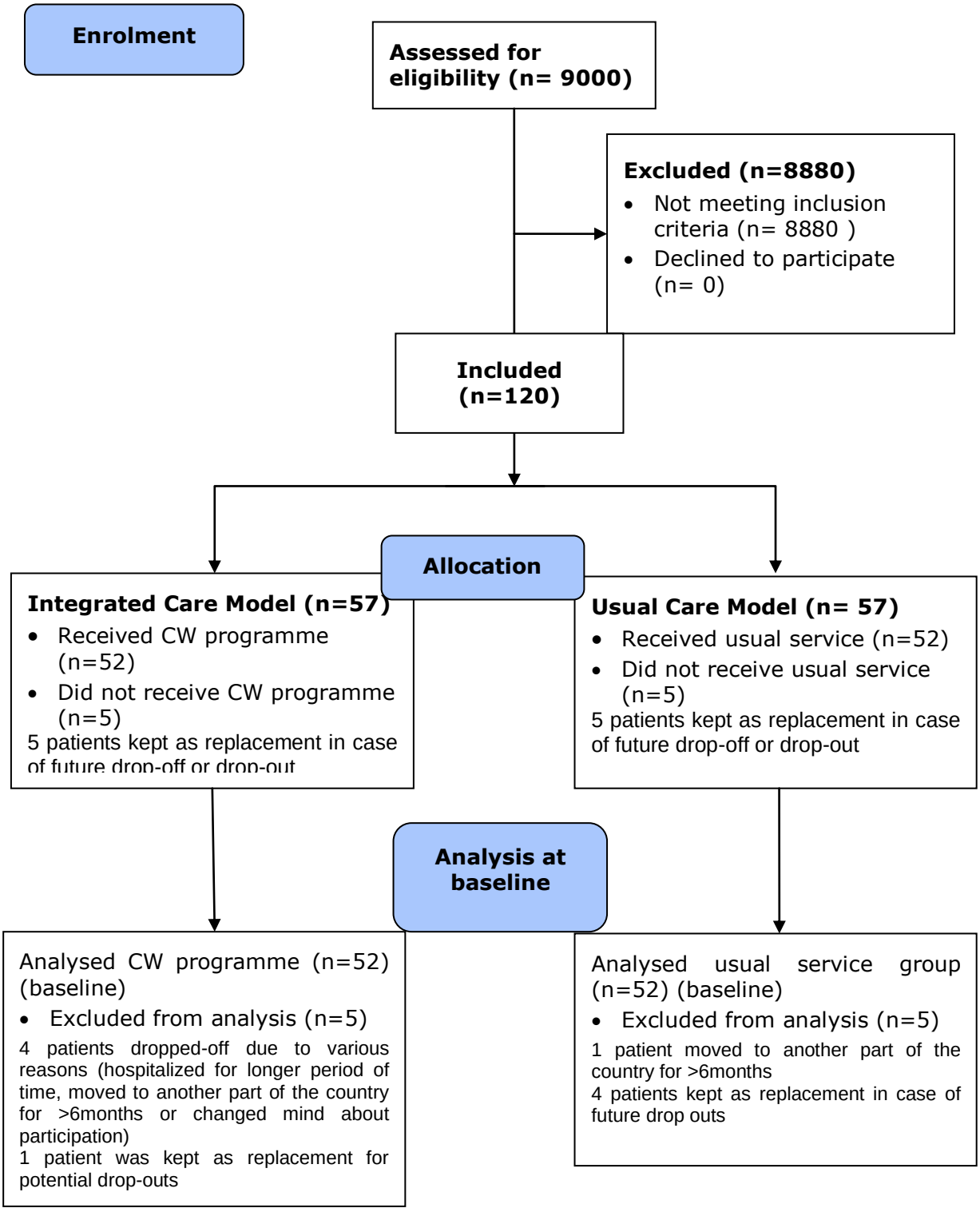

Figure 7: Croatia: Enrolment flowchart

3.3.3 Lower Silesia

Flow-chart filled out: January, 2015

The recruitment carried out: 21st September 2015 to 27th November 2016

Professionals in charge of the recruitment: GPs

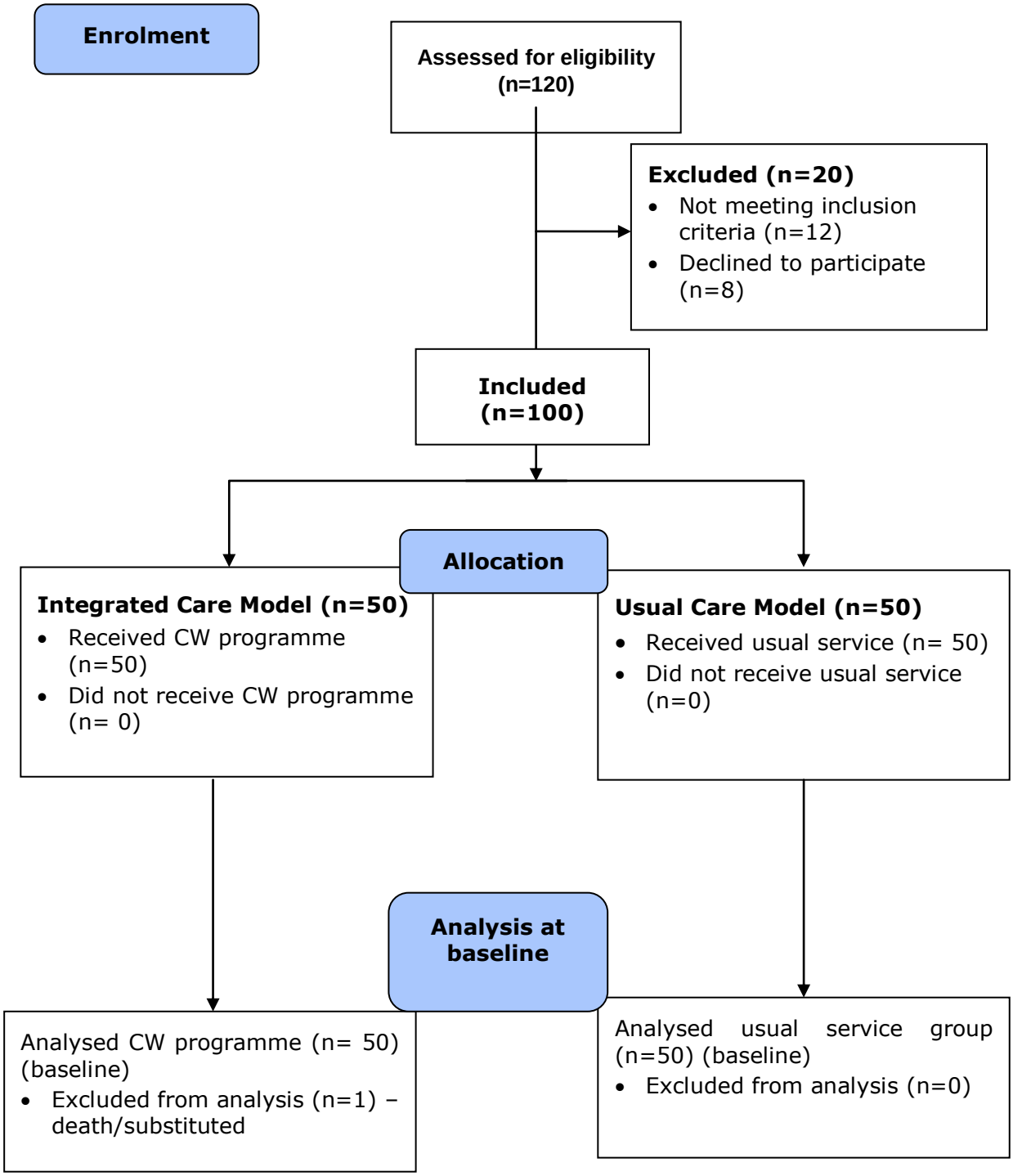

Figure 8: Lower Silesia: Enrolment flowchart

3.3.4 Veneto

Flow-chart filled out: January 2016

The recruitment carried out: From September 2015 (still ongoing)

Professionals in charge of the recruitment: GPs

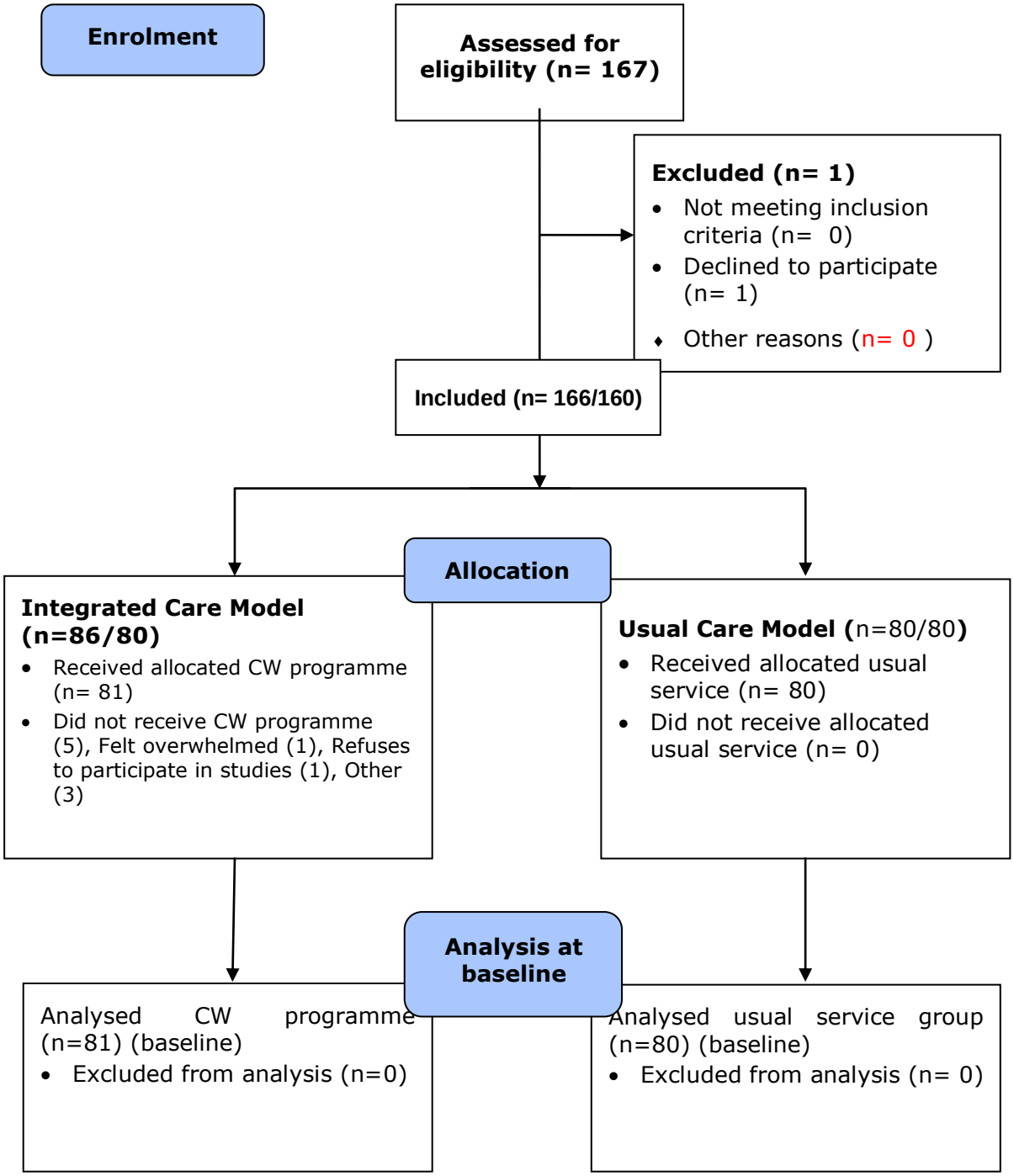

Figure 9: Veneto: Enrolment flowchart

3.3.5 Puglia

The flow-chart filled out: January, 2016

The recruitment carried out: February 2015 - 30th June. 2015

Professionals in charge of the recruitment: The GP or the Care Manager / GP nurse

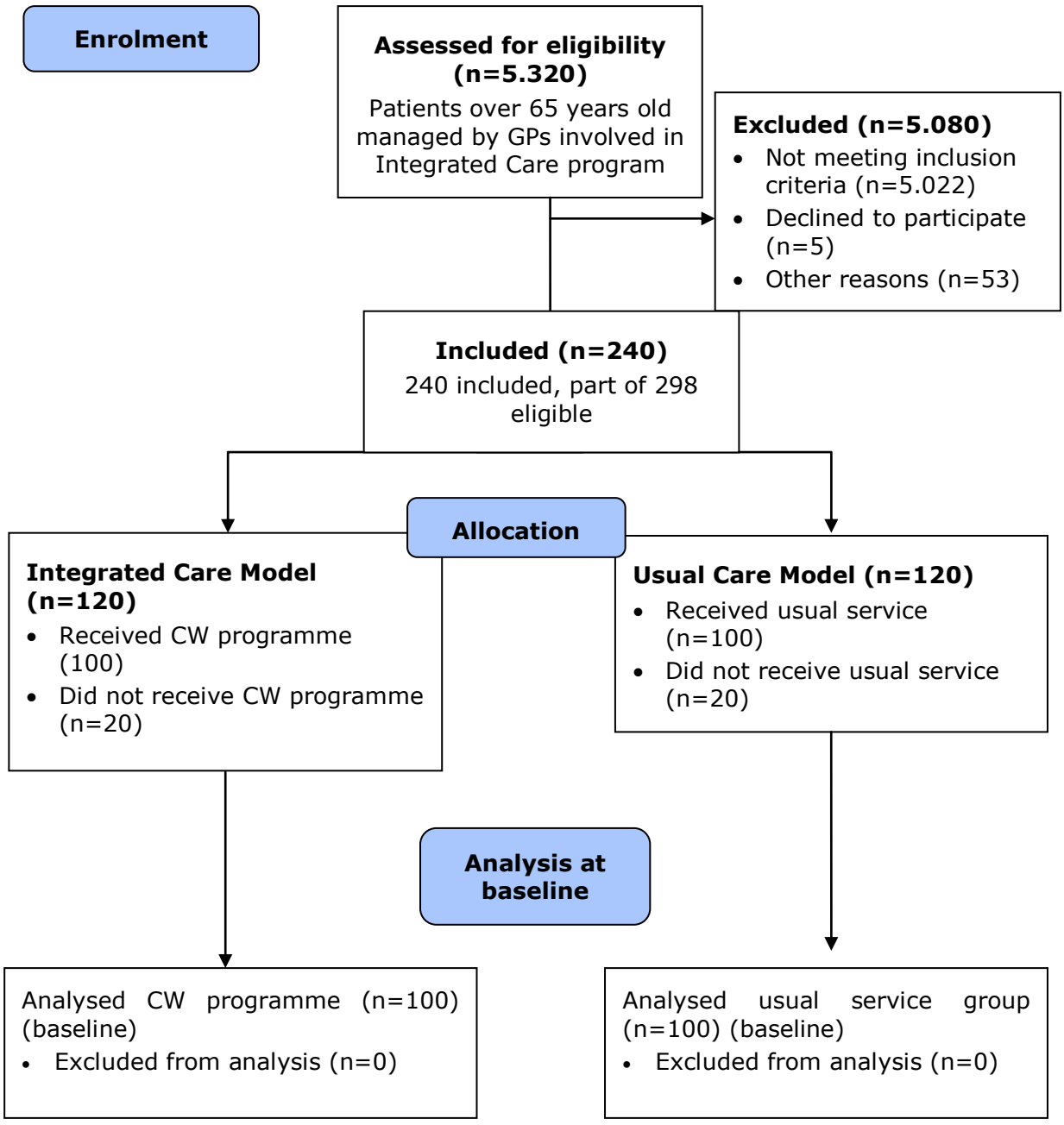

Figure 10: Puglia: Enrolment flowchart

3.3.6 Powys

The flow chart has being filled out: January 2016

The recruitment has been carried out: Start in April 2015 and continues beyond November 2015

Professionals in charge of the recruitment: The general practices in Powys were viewed as best placed and responsible for the recruitment of patients, the management of which is co-ordinated by the local Project Team.

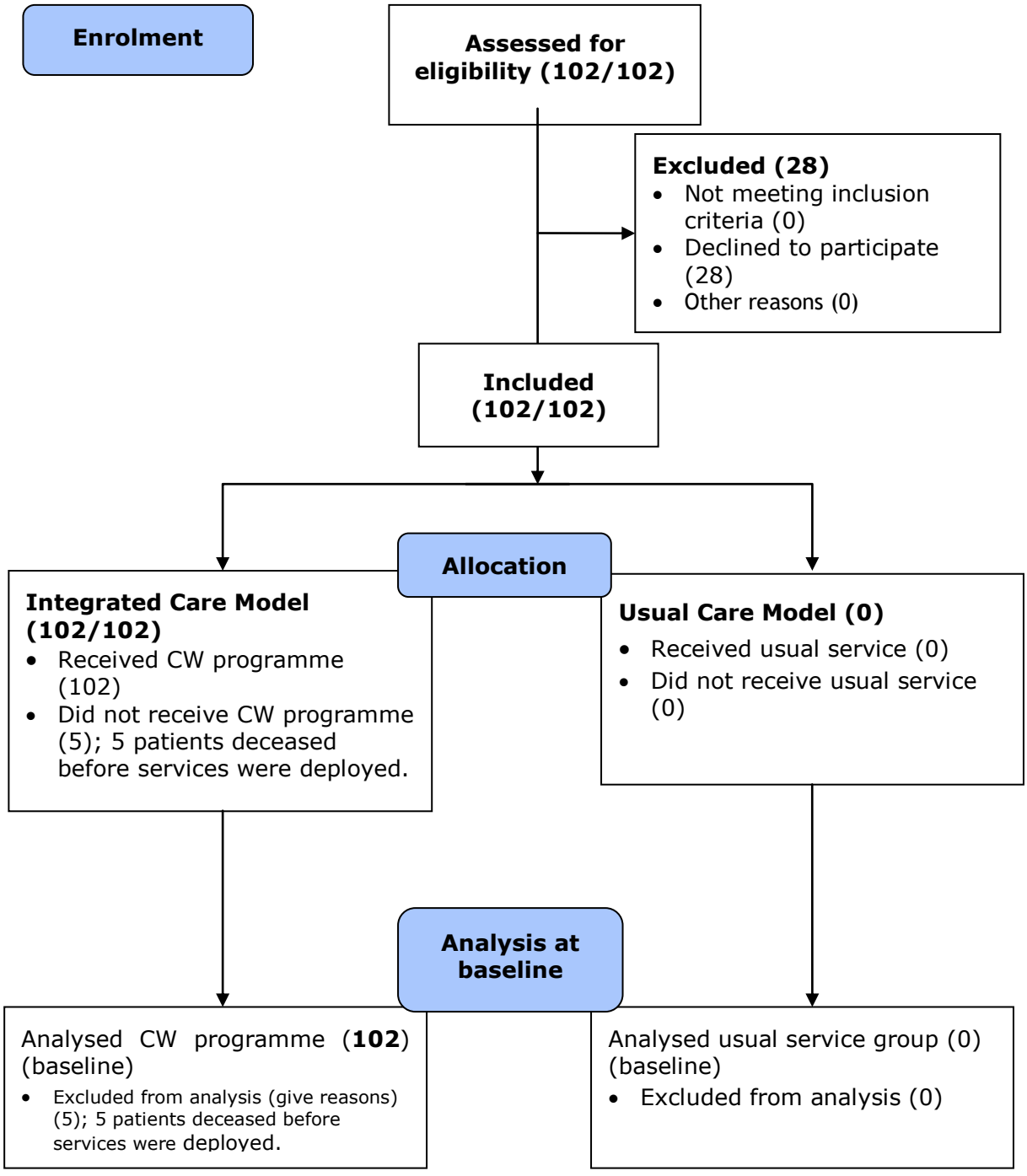

Figure 11: Powys: Enrolment flowchart

3.4 Baseline analysis

This section presents the results of the baseline analysis performed for each pilot site, and also for the total of recruited patients across all the sites. It is very important to note that some discrepancies will be found between the figures indicated in the flow charts above, and the figures the baseline analysis has been performed on. This is due to the complex process of data uploading, reviewing and cleansing, and the conditions and time schedules to upload and access data both for the pilot sites' data managers as well as for the evaluation team. All these conditions and procedures are necessary in order to guarantee the quality and safety procedures of a research project with these characteristics. This situation had its maximum impact for Powys. At this site, they are

recruiting according to their objectives and timescales, but circumstances related to the data uploading requirements and follow up have made it impossible for this data to be included in the overall analysis. These issues have been resolved and their site specific results as well as the global analysis with these data included will be provided in upcoming versions of this deliverable.

For each pilot site, two tables are presented and discussed:

- The first table presents the baseline characteristics of the evaluation population: age, gender and other socioeconomic measures, clinical description and comorbidities, as well as functional status. This information is presented separately for the intervention and control groups, and the statistical signification of any difference is provided. This assessment is relevant in order to state the comparability of the groups.
- The second table presents the same data but categorised by gender.
- The third table presents an analysis of the answers to the PIRU Questionnaire. This enables an approach, from a preliminary quantitative perspective, how the care process is perceived and valued by the participants.

The baseline questionnaires were: Charlson comorbidity index (CCI), Barthel Index of Activities of Daily Living (IADL), Geriatric Depression Scale (Short Form) and PIRU questionnaire on user experience of integrated care.

- The Charlson Comorbidity Index contains 19 categories of comorbidity, which are primarily defined using ICD-9-CM diagnosis codes. Each category has an associated weight, taken from the original Charlson paper1, which is based on the adjusted risk of one-year mortality. The overall comorbidity score reflects the cumulative increased likelihood of one-year mortality; the higher the score, the more severe the burden of comorbidity.
- The Barthel Index (BI) was developed as a measure to assess disability in patients with neuromuscular and musculoskeletal conditions receiving inpatient rehabilitation; it is recommended for routine use in the assessment of older people. The index is an ordinal scale comprising ten activities of daily living. The original BI was scored in steps of five points to give a maximum total score of 100. A widely adopted modification to the index includes a revised score range of 0–20. Information can be obtained from the patient's self-report, from a separate party who is familiar with the patient's abilities (such as a relative), or from observation. Lower scores indicating increased disability.
- The Geriatric Depression Scale (GDS) has been tested and used extensively with the older population. The GDS Long Form is a 30-item questionnaire in which participants are asked to respond by answering yes or no in reference to how they felt over the past week. A Short Form GDS consisting of 15 questions was developed in 1986. Five questions from the Long Form GDS which had the highest correlation with depressive symptoms in validation studies were selected for the short version. Of the 15 items, 10 indicate the presence of depression when answered positively, while the rest (question numbers 1, 5, 7, 11, 13) indicated depression when answered negatively. Scores of 0-4 are considered normal, depending on age, education, and complaints; 5-8 indicate mild depression; 9-11 indicate moderate depression; and 12-15 indicate severe depression.
- PIRU questionnaire on user experience of integrated care measures people's self-reported experiences of integrated care. It provides 18 questions that were derived from the National Voices integrated care 'I statements' and tested with patients, social care service users and carers.

The baseline results for each site are presented below.

3.4.1 Basque Country

The total number of expected patients (201) have been recruited; 101 patients have been assigned to the intervention group, and 100 to the control group.

3.4.1.1 Analysis of demographic and clinical indicators, by group

Participants have a mean age of 79.4 years, being a bit older in the intervention group, but without statistical significance. Regarding gender distribution, 62.7% are men without differences between groups. Education level is also comparable, with most participants having completed primary school education; also comparable is the household income level. The low number of missing answers to this question is interesting; it tends to be avoided by participants of this age.

More surprising are the absence of differences in mobile and PC use between groups, and the high percentage of subjects familiar with the phone and low with PCs.

With regard to health related life habits, most of the participants present a moderate pattern of alcohol consumption. Most participants have never smoked, nor are former smokers, without differences between groups.

When clinical control parameters are assessed, the mean blood pressure, both systolic and diastolic, categorises as hypertension; but even though the differences between control and intervention group are statistically significant, they do not have clinical meaning. The high number of missing values for HbA1c and creatinine levels reflects their clinical relevance to specific diseases, for example, HbA1c would only be assessed for diabetic patients; it has no clinical meaning for patients with other diseases. All the assessed parameters are close to good control values.

The most prevalent primary disease is COPD, both for intervention and control group; the most prevalent secondary disease is CHF, with frequencies comparable between both groups.

Another significant characteristic of participants is their level of functional dependence, measured by the Barthel Index. There are no differences between the intervention and the control groups, and all present a median of 100 indicating autonomy.

Regarding baseline mental health, both groups present mean values corresponding to normality, though close to depression.

Table 1: Basque Country: Baseline characteristics by group

Measurement	Total	Missing	Intervention	Control	p-value
Sample size (n)	*201*		*101*	*100*	
Age	79.38 (6.82)	*0*	79.56 (6.91)	79.19 (6.75)	**0.698**
Gender		*0*			**0.353**
Female	75 (37.3%)		34 (33.7%)	41 (41%)	
Male	126 (62.7%)		67 (66.3%)	59 (59%)	
Marital status		*0*			**0.363**
Never married	12 (6%)		8 (7.9%)	4 (4%)	
Currently married	124 (61.7%)		65 (64.4%)	59 (59%)	
Separated	3 (1.5%)		2 (2%)	1 (1%)	
Divorced	0 (0%)		0 (0%)	0 (0%)	
Widowed	61 (30.3%)		26 (25.7%)	35 (35%)	
Cohabitating	1 (0.5%)		0 (0%)	1 (1%)	
Education		*1*			**0.079**
Less than primary school	41 (20.5%)		16 (16%)	25 (25%)	
Primary school	118 (59%)		59 (59%)	59 (59%)	
Secondary school	0 (0%)		0 (0%)	0 (0%)	
High school	33 (16.5%)		18 (18%)	15 (15%)	

Measurement	Total	Missing	Intervention	Control	p-value
College/University	8 (4%)		7 (7%)	1 (1%)	
Post graduate degree	0 (0%)		0 (0%)	0 (0%)	
Longest held occupation		*1*			**0.834**
Manual	1 (0.5%)		0 (0%)	1 (1%)	
Non manual	1 (0.5%)		1 (1%)	0 (0%)	
Unemployed (but able to work)	1 (0.5%)		0 (0%)	1 (1%)	
Unemployed (unable to work)	171 (85.5%)		85 (85%)	86 (86%)	
Homemaker	26 (13%)		14 (14%)	12 (12%)	
Household income (euro/year)		*12*			**0.089**
0-6.999	0 (0%)		0 (0%)	0 (0%)	
7.000-13.999	140 (74.1%)		76 (80%)	64 (68.1%)	
14.000-19.999	0 (0%)		0 (0%)	0 (0%)	
20.000 or more	49 (25.9%)		19 (20%)	30 (31.9%)	
Housing tenure		*4*			**0.841**
Owners	175 (88.8%)		87 (87.9%)	88 (89.8%)	
Renters	22 (11.2%)		12 (12.1%)	10 (10.2%)	
People older than 18 living in household, median (IQR)	-	-	-	-	**-**
Mobile use (Yes)	124 (61.7%)	*0*	58 (57.4%)	66 (66%)	**0.269**
PC use (Yes)	20 (10%)	*0*	13 (12.9%)	7 (7%)	**0.248**
Alcohol		*14*			**0.097**
None	121 (64.7%)		56 (58.9%)	65 (70.7%)	
Less than 1/week	8 (4.3%)		7 (7.4%)	1 (1.1%)	
1-7/week	15 (8%)		7 (7.4%)	8 (8.7%)	
8-14/week	43 (23%)		25 (26.3%)	18 (19.6%)	
15-21/week	0 (0%)		0 (0%)	0 (0%)	
More than 21/week	0 (0%)		0 (0%)	0 (0%)	
Tobacco use		*0*			**0.339**
Never	118 (58.7%)		58 (57.4%)	60 (60%)	
Former	67 (33.3%)		32 (31.7%)	35 (35%)	
Current smoker	13 (6.5%)		8 (7.9%)	5 (5%)	
e-cigarette	0 (0%)		0 (0%)	0 (0%)	
Other	3 (1.5%)		3 (3%)	0 (0%)	
Height (cm)	161.96 (9.43)	*1*	161.56 (9.3)	162.36 (9.58)	**0.550**
Weight (kg)	79.99 (17.18)	*1*	82.43 (17.78)	77.55 (16.28)	**0.044**
Body Mass Index (BMI)	30.42 (5.52)	*1*	31.49 (5.64)	29.35 (5.21)	**0.006**
Heart rate (bpm)	72.41 (11.53)	*0*	73.26 (11.43)	71.55 (11.63)	**0.295**
Systolic blood pressure (mmHg)	135.25 (17.03)	*0*	131.89 (15.82)	138.64 (17.61)	**0.005**
Diastolic blood pressure (mmHg)	71.07 (10.05)	*0*	70.75 (10.09)	71.4 (10.06)	**0.649**
Oxygen saturation (%)	95.8 (2.38)	*3*	95.82 (2.15)	95.79 (2.60)	**0.938**
Blood glucose (mg/dl)	117.89 (40.29)	*164*	115.35 (39.22)	120.88 (42.53)	**0.685**
HbA1c (%)	6.72 (1.17)	*181*	6.87 (1.3)	6.38 (0.78)	**0.316**
Creatinine (mg/dl)	1.28 (0.70)	*164*	1.13 (0.38)	1.44 (0.92)	**0.198**
Primary disease					
Primary disease CHF	47 (23.4%)	*0*	25 (24.8%)	22 (22%)	**0.769**
Primary disease COPD	99 (49.3%)	*0*	46 (45.5%)	53 (53%)	**0.360**
Primary disease DIABETES	54 (26.9%)	*0*	29 (28.7%)	25 (25%)	**0.664**
Secondary disease					
Secondary disease CHF	113 (56.2%)	*0*	57 (56.4%)	56 (56%)	**1.000**
Secondary disease COPD	77 (38.3%)	*0*	42 (41.6%)	35 (35%)	**0.415**
Secondary disease DIABETES	93 (46.3%)	*0*	37 (36.6%)	56 (56%)	**0.009**
Comorbidity ICD-10 codes					
Myocardial infarct	32 (15.9%)	*0*	19 (18.8%)	13 (13%)	**0.351**
Congestive heart failure	160 (79.6%)	*0*	82 (81.2%)	78 (78%)	**0.700**
Peripheral vascular disease	66 (32.8%)	*0*	31 (30.7%)	35 (35%)	**0.617**

Measurement	Total	Missing	Intervention	Control	p-value
Cerebrovascular disease	28 (13.9%)	*0*	11 (10.9%)	17 (17%)	**0.295**
Dementia	19 (9.5%)	*0*	6 (5.9%)	13 (13%)	**0.142**
Chronic pulmonary disease	176 (87.6%)	*0*	88 (87.1%)	88 (88%)	**1.000**
Rheumatic disease	18 (9%)	*0*	9 (8.9%)	9 (9%)	**1.000**
Peptic ulcer disease	9 (4.5%)	*0*	3 (3%)	6 (6%)	**0.331**
Mild liver disease	36 (17.9%)	*0*	13 (12.9%)	23 (23%)	**0.091**
Diabetes without chronic complication	147 (73.1%)	*0*	66 (65.3%)	81 (81%)	**0.019**
Diabetes with chronic complication	25 (12.4%)	*0*	12 (11.9%)	13 (13%)	**0.979**
Hemiplegia or paraplegia	14 (7%)	*0*	9 (8.9%)	5 (5%)	**0.417**
Renal disease	93 (46.3%)	*0*	41 (40.6%)	52 (52%)	**0.139**
Any malignancy	24 (11.9%)	*0*	15 (14.9%)	9 (9%)	**0.288**
Moderate or severe liver disease	33 (16.4%)	*0*	18 (17.8%)	15 (15%)	**0.727**
Metastatic solid tumor	2 (1%)	*0*	2 (2%)	0 (0%)	**0.498**
Barthel index, median (IQR)	100 (80,100)	*0*	100 (80,100)	100 (80,100)	**0.918**
GDS - Geriatric Depression Scale (Short Form)	4.12 (3.06)	*0*	3.56 (2.75)	4.68 (3.27)	**0.010**
Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.					

3.4.1.2 Analysis of demographic and clinical indicators, by group and gender

Additional analyses have been performed separately for men and women in order to assess the effect of gender in the baseline situation of patients. Some relevant differences when gender is considered arise between intervention and control group. Females are older than men in both groups, with a difference of three years in the mean between gender groups. This difference is present for both intervention and control groups. Marital status is also different with more women being widows in both groups. Alcohol consumption is also different for men or women: for the latter, the most frequent condition is taking no alcohol at all. The same occurs with tobacco consumption: it is almost absent among women.

There are also expected differences regarding body size, height, weight and Body Mass Index (BMI). No differences are found in clinical variables.

COPD is the primary disease for most men in both intervention and control groups, and CHF for women, also in both groups. Women also present poorer results when mental health is explored. All these differences are shown in Table 2.

Table 2: Basque Country: Baseline characteristics by group and gender

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Sample size (n)	*34*	*67*		*41*	*59*	
Age	81.62 (5.4)	78.52 (7.38)	**0.019**	81.2 (6.11)	77.8 (6.87)	**0.011**
Marital status			**0.001**			**<0.001**
Never married	1 (2.9%)	7 (10.4%)		1 (2.4%)	3 (5.1%)	
Currently married	16 (47.1%)	49 (73.1%)		14 (34.1%)	45 (76.3%)	
Separated	0 (0%)	2 (3%)		0 (0%)	1 (1.7%)	
Divorced	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Widowed	17 (50%)	9 (13.4%)		26 (63.4%)	9 (15.3%)	
Cohabitating	0 (0%)	0 (0%)		0 (0%)	1 (1.7%)	
Education			**0.142**			**0.373**
Less than primary school	9 (27.3%)	7 (10.4%)		9 (22%)	16 (27.1%)	
Primary school	19 (57.6%)	40 (59.7%)		28 (68.3%)	31 (52.5%)	
Secondary school	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
High school	4 (12.1%)	14 (20.9%)		4 (9.8%)	11 (18.6%)	
College/University	1 (3%)	6 (9%)		0 (0%)	1 (1.7%)	

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Post graduate degree	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Longest held occupation			**<0.001**			**<0.001**
Manual	0 (0%)	0 (0%)		1 (2.4%)	0 (0%)	
Non manual	0 (0%)	1 (1.5%)		0 (0%)	0 (0%)	
Unemployed (but able to work)	0 (0%)	0 (0%)		0 (0%)	1 (1.7%)	
Unemployed (unable to work)	19 (57.6%)	66 (98.5%)		28 (68.3%)	58 (98.3%)	
Homemaker	14 (42.4%)	0 (0%)		12 (29.3%)	0 (0%)	
Household income (€/year)			**0.352**			**0.011**
0-6.999	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
7.000-13.999	27 (87.1%)	49 (76.6%)		32 (84.2%)	32 (57.1%)	
14.000-19.999	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
20.000 or more	4 (12.9%)	15 (23.4%)		6 (15.8%)	24 (42.9%)	
Housing tenure			**1.000**			**0.736**
Owners	29 (87.9%)	58 (87.9%)		35 (87.5%)	53 (91.4%)	
Renters	4 (12.1%)	8 (12.1%)		5 (12.5%)	5 (8.6%)	
People older than 18 living in household, median (IQR)	-	-		-	-	**-**
Mobile use (Yes)	17 (50%)	41 (61.2%)	**0.389**	27 (65.9%)	39 (66.1%)	**1.000**
PC use (Yes)	2 (5.9%)	11 (16.4%)	**0.209**	1 (2.4%)	6 (10.2%)	**0.235**
Alcohol			**0.230**			**<0.001**
None	23 (74.2%)	33 (51.6%)		36 (92.3%)	29 (54.7%)	
Less than 1/week	2 (6.5%)	5 (7.8%)		0 (0%)	1 (1.9%)	
1-7/week	1 (3.2%)	6 (9.4%)		1 (2.6%)	7 (13.2%)	
8-14/week	5 (16.1%)	20 (31.2%)		2 (5.1%)	16 (30.2%)	
15-21/week	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
More than 21/week	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Tobacco use			**<0.001**			**<0.001**
Never	33 (97.1%)	25 (37.3%)		36 (87.8%)	24 (40.7%)	
Former	0 (0%)	32 (47.8%)		5 (12.2%)	30 (50.8%)	
Current smoker	0 (0%)	8 (11.9%)		0 (0%)	5 (8.5%)	
e-cigarette	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Other	1 (2.9%)	2 (3%)		0 (0%)	0 (0%)	
Height (cm)	152.29 (5.9)	166.33 (6.78)	**<0.001**	155.2 (7.72)	167.34 (7.35)	**<0.001**
Weight (kg)	72.76 (11.23)	87.41 (18.53)	**<0.001**	67.98 (12.28)	84.2 (15.45)	**<0.001**
Body Mass Index (BMI)	31.43 (5.05)	31.53 (5.96)	**0.932**	28.31 (5.21)	30.07 (5.13)	**0.099**
Heart rate (bpm)	74 (10.58)	72.88 (11.9)	**0.632**	70.8 (11.47)	72.07 (11.8)	**0.594**
Systolic blood pressure	129 (13.63)	133.36 (16.72)	**0.164**	139.32 (18.27)	138.17 (17.29)	**0.753**
Diastolic blood pressure	69.65 (9.42)	71.31 (10.44)	**0.421**	71.59 (9.38)	71.27 (10.58)	**0.876**
Oxygen saturation (%)	96.18 (1.69)	95.63 (2.34)	**0.186**	96.24 (1.53)	95.47 (3.11)	**0.105**
Blood glucose (mg/dl)	123.71 (41.29)	110.85 (38.99)	**0.511**	133.71 (57.3)	111.9 (28.43)	**0.379**
HbA1c (%)	7.4 (1.66)	6.47 (0.85)	**0.253**	6.48 (0.83)	5.9 (-)	**-**
Creatinine (mg/dl)	1.11 (0.34)	1.14 (0.41)	**0.898**	1.96 (1.26)	1.11 (0.4)	**0.129**
Primary disease						
Primary disease CHF	11 (32.4%)	14 (20.9%)	**0.309**	13 (31.7%)	9 (15.3%)	**0.088**
Primary disease COPD	8 (23.5%)	38 (56.7%)	**0.003**	16 (39%)	37 (62.7%)	**0.033**
Primary disease DIABETES	14 (41.2%)	15 (22.4%)	**0.082**	12 (29.3%)	13 (22%)	**0.557**
Secondary disease						
Secondary disease CHF	22 (64.7%)	35 (52.2%)	**0.326**	21 (51.2%)	35 (59.3%)	**0.550**
Secondary disease COPD	19 (55.9%)	23 (34.3%)	**0.062**	17 (41.5%)	18 (30.5%)	**0.359**
Secondary disease DIABETES	12 (35.3%)	25 (37.3%)	**1.000**	22 (53.7%)	34 (57.6%)	**0.851**
Comorbidity ICD-10 codes						
Myocardial infarct	6 (17.6%)	13 (19.4%)	**1.000**	4 (9.8%)	9 (15.3%)	**0.616**
Congestive heart failure	33 (97.1%)	49 (73.1%)	**0.008**	34 (82.9%)	44 (74.6%)	**0.456**

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Peripheral vascular disease	7 (20.6%)	24 (35.8%)	**0.180**	13 (31.7%)	22 (37.3%)	**0.717**
Cerebrovascular disease	5 (14.7%)	6 (9%)	**0.501**	8 (19.5%)	9 (15.3%)	**0.774**
Dementia	3 (8.8%)	3 (4.5%)	**0.402**	5 (12.2%)	8 (13.6%)	**1.000**
Chronic pulmonary disease	27 (79.4%)	61 (91%)	**0.121**	33 (80.5%)	55 (93.2%)	**0.066**
Rheumatic disease	4 (11.8%)	5 (7.5%)	**0.480**	4 (9.8%)	5 (8.5%)	**1.000**
Peptic ulcer disease	0 (0%)	3 (4.5%)	**0.549**	1 (2.4%)	5 (8.5%)	**0.396**
Mild liver disease	4 (11.8%)	9 (13.4%)	**1.000**	6 (14.6%)	17 (28.8%)	**0.157**
Diabetes without chronic complication	26 (76.5%)	40 (59.7%)	**0.146**	34 (82.9%)	47 (79.7%)	**0.881**
Diabetes with chronic complication	6 (17.6%)	6 (9%)	**0.212**	6 (14.6%)	7 (11.9%)	**0.918**
Hemiplegia or paraplegia	2 (5.9%)	7 (10.4%)	**0.714**	1 (2.4%)	4 (6.8%)	**0.646**
Renal disease	15 (44.1%)	26 (38.8%)	**0.765**	22 (53.7%)	30 (50.8%)	**0.942**
Any malignancy	3 (8.8%)	12 (17.9%)	**0.359**	4 (9.8%)	5 (8.5%)	**1.000**
Moderate or severe liver disease	7 (20.6%)	11 (16.4%)	**0.808**	5 (12.2%)	10 (16.9%)	**0.711**
Metastatic solid tumor	0 (0%)	2 (3%)	**0.549**	0 (0%)	0 (0%)	**1.000**
Barthel index, median (IQR)	92.5 (75,100)	100 (85,100)	**0.053**	85 (75,100)	100 (87.5,100)	**0.008**
GDS - Geriatric Depression Scale (Short Form)	4.09 (2.79)	3.3 (2.71)	**0.179**	5.17 (3.45)	4.34 (3.12)	**0.221**
Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.						

3.4.1.3 Analysis of PIRU by group

Significant differences can be found between intervention and control groups in almost all the questions, with the intervention group, in general, being more satisfied with the usual received care. The presence of this difference is probably unavoidable at this point; so the discussion of the results and analysis for PIRU questionnaire should be based on the differences found between pre and post values in order to avoid the introduction of bias.

Considering the questions of the PIRU questionnaire in individually, it is interesting to note that the first set of questions that explore the perceived involvement of the patients and the carers in the decision making process related to the care provision is very positive, and more so among the subjects in the intervention group. When information and treatment review is explored, satisfaction is still very high, but lower for controls. And finally, when access to care and to other services is explored, results are variable, again tending to high satisfaction and low when availability of other services is explored.

Table 3: Basque Country: Baseline PIRU questionnaire by group

Measurement	Total	missing	Intervention	Control	p-value
Have all your needs been assessed?		*0*			**<0.001**
All of my needs have been assessed	161 (80.1%)		92 (91.1%)	69 (69%)	
Some of my needs have been assessed	39 (19.4%)		9 (8.9%)	30 (30%)	
None of my needs have been assessed	1 (0.5%)		0 (0%)	1 (1%)	
Don't know/can't remember	0 (0%)		0 (0%)	0 (0%)	
Were you involved as much as you wanted to be in decisions about your care and support?					
		0			**<0.001**
Yes, definitely	160 (79.6%)		93 (92.1%)	67 (67%)	
Yes, to some extent	32 (15.9%)		8 (7.9%)	24 (24%)	
No	9 (4.5%)		0 (0%)	9 (9%)	

Measurement	Total	missing	Intervention	Control	p-value
Were you involved as much as you wanted to be in decisions about your treatment?					
		0			**<0.001**
Yes, definitely	152 (75.6%)		91 (90.1%)	61 (61%)	
Yes, to some extent	37 (18.4%)		10 (9.9%)	27 (27%)	
No	12 (6%)		0 (0%)	12 (12%)	
Were your family or carer involved in decisions about your care and support as much as you wanted them to be?					
		0			**0.086**
Yes, definitely	159 (79.1%)		86 (85.1%)	73 (73%)	
Yes, to some extent	15 (7.5%)		3 (3%)	12 (12%)	
No	7 (3.5%)		2 (2%)	5 (5%)	
There were no family or carers available to be involved	16 (8%)		8 (7.9%)	8 (8%)	
I didn't want my family or carer to be involved in decisions about my care and support	4 (2%)		2 (2%)	2 (2%)	
Were your family or carer involved in decisions about your treatment as much as you wanted them to be?					
		0			**0.184**
Yes, definitely	160 (79.6%)		86 (85.1%)	74 (74%)	
Yes, to some extent	13 (6.5%)		3 (3%)	10 (10%)	
No	4 (2%)		2 (2%)	2 (2%)	
There were no family or carers available to be involved	17 (8.5%)		8 (7.9%)	9 (9%)	
I didn't want my family or carer to be involved in decisions about my treatment and support	7 (3.5%)		2 (2%)	5 (5%)	
Overall, do you feel that your carer/family has had as much support from health and social services as they needed?					
		0			**<0.001**
Yes, they have had as much support as they needed	90 (44.8%)		65 (64.4%)	25 (25%)	
They have had some support but not as much as they needed	25 (12.4%)		19 (18.8%)	6 (6%)	
No, they have had little or no support	10 (5%)		4 (4%)	6 (6%)	
They did not want/need support	71 (35.3%)		11 (10.9%)	60 (60%)	
There are no family members or carers to support	5 (2.5%)		2 (2%)	3 (3%)	
To what extent do you agree or disagree with the following statement...'Health and social care staff always tell me what will happen next'					
		0			**0.143**
Strongly agree	147 (73.1%)		78 (77.2%)	69 (69%)	
Agree	23 (11.4%)		6 (5.9%)	17 (17%)	
Neither agree nor disagree	14 (7%)		8 (7.9%)	6 (6%)	
Disagree	15 (7.5%)		8 (7.9%)	7 (7%)	
Strongly disagree	2 (1%)		1 (1%)	1 (1%)	
When health or social care staff plan care or treatment for you, does it happen?					
		0			**0.001**
Yes, it happens all of the time	172 (85.6%)		92 (91.1%)	80 (80%)	
It happens most of the time	17 (8.5%)		4 (4%)	13 (13%)	

Measurement	Total	missing	Intervention	Control	p-value
It happens some of the time	8 (4%)		1 (1%)	7 (7%)	
No	4 (2%)		4 (4%)	0 (0%)	
To what extent do you agree or disagree with the following statement…'My care and support is reviewed as often as it should be'					
		0			**0.092**
Strongly agree	174 (86.6%)		92 (91.1%)	82 (82%)	
Agree	15 (7.5%)		3 (3%)	12 (12%)	
Neither agree nor disagree	5 (2.5%)		2 (2%)	3 (3%)	
Disagree	6 (3%)		3 (3%)	3 (3%)	
Strongly disagree	1 (0.5%)		1 (1%)	0 (0%)	
To what extent do you agree or disagree with the following statement…'My treatment is reviewed as often as it should be'					
		0			**0.094**
Strongly agree	172 (85.6%)		91 (90.1%)	81 (81%)	
Agree	19 (9.5%)		5 (5%)	14 (14%)	
Neither agree nor disagree	4 (2%)		1 (1%)	3 (3%)	
Disagree	4 (2%)		3 (3%)	1 (1%)	
Strongly disagree	2 (1%)		1 (1%)	1 (1%)	
To what extent do you agree or disagree with the following statement…'My medicines are thoroughly reviewed as often as they should be'					
		0			**0.029**
Strongly agree	152 (75.6%)		73 (72.3%)	79 (79%)	
Agree	19 (9.5%)		6 (5.9%)	13 (13%)	
Neither agree nor disagree	20 (10%)		15 (14.9%)	5 (5%)	
Disagree	8 (4%)		6 (5.9%)	2 (2%)	
Strongly disagree	2 (1%)		1 (1%)	1 (1%)	
Do you have a named health or social care professional who co-ordinates your care and support?					
		0			**0.121**
Yes	198 (98.5%)		101 (100%)	97 (97%)	
No, I co-ordinate my own care and support	2 (1%)		0 (0%)	2 (2%)	
Don't know/not sure	1 (0.5%)		0 (0%)	1 (1%)	
If you have questions, when can you contact the people treating and caring for you? Please tick ALL the apply					
		0			**0.003**
During normal working hours	192 (95.5%)		92 (91.1%)	100 (100%)	
During the evening	7 (3.5%)		7 (6.9%)	0 (0%)	
During the night	0 (0%)		0 (0%)	0 (0%)	
Weekends	0 (0%)		0 (0%)	0 (0%)	
Don't know/not sure	2 (1%)		2 (2%)	0 (0%)	
Do you feel this person understands about you and your condition?					
		0			**0.883**
Yes, definitely	188 (93.5%)		95 (94.1%)	93 (93%)	
Yes, to some extent	11 (5.5%)		5 (5%)	6 (6%)	
No	2 (1%)		1 (1%)	1 (1%)	

Measurement	Total	missing	Intervention	Control	p-value
Do all the different people treating and caring for you work well together to give you the best possible care and support?					
		0			**0.444**
Yes, all of them work well together	178 (88.6%)		91 (90.1%)	87 (87%)	
Most of them work well together	10 (5%)		4 (4%)	6 (6%)	
Some of them work well together	10 (5%)		6 (5.9%)	4 (4%)	
No, they do not work well together	1 (0.5%)		0 (0%)	1 (1%)	
Don't know/not sure	2 (1%)		0 (0%)	2 (2%)	
Do health and social care services help you live the life you want as far as possible?					
		0			**<0.001**
Yes, definitely	104 (51.7%)		66 (65.3%)	38 (38%)	
Yes, to some extent	76 (37.8%)		26 (25.7%)	50 (50%)	
No	21 (10.4%)		9 (8.9%)	12 (12%)	
To what extent do you agree or disagree with the following statement…'In the last 12 months, health and social care staff have given me information about other services that are available to someone in my circumstances, including support organisations'					
		0			**<0.001**
Strongly agree	37 (18.4%)		18 (17.8%)	19 (19%)	
Agree	22 (10.9%)		0 (0%)	22 (22%)	
Neither agree nor disagree	19 (9.5%)		2 (2%)	17 (17%)	
Disagree	123 (61.2%)		81 (80.2%)	42 (42%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	

3.4.2 Croatia

In baseline enrolment we had an equal sample of patients in intervention and control group, 52 in each.

3.4.2.1 Analysis of demographic and clinical indicators, by group

Average age was 76,85 for intervention group and 78,24% for control group. Gender-wise, we had an equally distributed number of patients: 55,1% male patients in intervention group versus 60% in the control group. Regarding other characteristics, in both groups, most patients are still married (71,5% in intervention and 50,0% in control); most patients finished high school (47,0% in intervention and 40,0% in control); most worked in a non-manual job (54,6% for intervention and 47,9% for control); but every enrolled patient declined to answer about income. Almost all of the patients are owners of their houses / apartments (93,5% for intervention group and 97,8% for control). The average number of people above 18 years of age living in the household is 2,88 (intervention) and 2,40 (control). More than half of them use mobile phone (63,3% intervention, 76,0% control) unlike PC where there is a smaller number of patients who know how to use it (30,6%for intervention and 22,0% for control). Similarly to household income, no patient wanted to respond regarding drinking alcohol. More than half of them never smoked tobacco, but a few still smoke (9,6% : 7,9%). Average height was 161,87cm for intervention and 159,92cm for control. Weight was also similar in both groups (71,12kg : 65,94kg).

Most patients had COPD as primary chronic disease in both groups, and CHF as secondary chronic disease. COPD had 42% and 44,7%, while CHF as a secondary disease had 60,0% and 52,1%. Regarding comorbidity, most patients had peripheral vascular disease (75,5% intervention and 71,4% control) and diabetes without chronic complication (76,9% intervention and 68,6% control). Interpretation of Barthel index shows us that patients from the intervention group, based by their scoring, are

moderately dependent (average score of 88,17) while patients from control group are only slightly dependent (average of 91,27). Analysing GDS scale in both groups, we conclude no group has suggestive depression: average score was 3,81 for intervention and 4,36 for control group. Analysing data we used student's t-test for quantitative variables and χ^2 test for qualitative variables. In these baseline characteristics, no statistically significant differences between intervention and control group were found in any of the variables (no significance was lesser or equal than 0.05 on the confidence interval of 95%).

Table 4: Croatia: Baseline characteristics by group

Measurement	Total	Missing	Intervention	Control	p-value
Sample size (n)	*104*	*0*	*52*	*52*	
Age	77.56 (6.93)	*5*	76.85 (6.60)	78.24 (7.23)	**0.325**
Gender		*5*			**0.622**
Male	42 (42.4%)		22 (44.9%)	20 (40.0%)	
Female	57 (57.6%)		27 (55.1%)	30 (60.0%)	
Marital status		*5*			**0.234**
Never married	2 (2.0%)		1 (2.0%)	1 (2.0%)	
Currently married	60 (60.6%)		35 (71.5%)	25 (50.0%)	
Separated	4 (4.0%)		0 (0%)	0 (0%)	
Divorced	0 (0%)		2 (4.1%)	2 (4.0%)	
Widowed	31 (31.3%)		10 (20.4%)	21 (42.0%)	
Cohabitating	2 (2.0%)		1 (2.0%)	1 (2.0%)	
Education		*5*			**0.181**
Less than primary school	7 (7.1%)		5 (10.2%)	2 (4.0%)	
Primary school	12 (12.1%)		4 (8.2%)	8 (16.0%)	
Secondary school	10 (10.1%)		3 (6.1%)	7 (14.0%)	
High school	43 (43.4%)		23 (47.0%)	20 (40.0%)	
College/University	24 (24.2%)		11 (22.4%)	13 (26.0%)	
Post graduate degree	3 (3.0%)		3 (6.1%)	0 (0%)	
Longest held occupation		*12*			**0.635**
Manual	36 (39.1%)		17 (38.6%)	19 (39.6%)	
Non manual	47 (51.1%)		24 (54.6%)	23 (47.9%)	
Unemployed (but able to work)	1 (1.1%)		0 (0%)	1 (2.1%)	
Unemployed (unable to work)	0 (0%)		0 (0%)	0 (0%)	
Homemaker	8 (8.7%)		3 (6.8%)	5 (10.4%)	
Household income (euro/year)					
0-6.999					
7.000-13.999	-	-	-	-	-
14.000-19.999					
2<0.001 or more					
Housing tenure		*13*			**0.543**
Owners	87 (95.6%)		43 (93.5%)	44 (97.8%)	
Renters	4 (4.4%)		3 (6.5%)	1 (2.2%)	
People older than 18 living in household. median (IQR)	2 (2,3)	*5*	2 (2,3)	2 (2,3)	**0.112**
Mobile use (Yes)	69 (69.7%)	*5*	31 (63.3%)	38 (76.0%)	**0.168**
PC use (Yes)	26 (26.3%)	*5*	15 (30.6%)	11 (22.0%)	**0.330**
Alcohol					
None					
Less than 1/week					
1-7/week	-	-	-	-	-
8-14/week					
15-21/week					
More than 21/week					

Measurement	Total	Missing	Intervention	Control	p-value
Tobacco use		*1*			**0.765**
Never	63 (61.2%)		33 (63.5%)	30 (58.8%)	
Former	31 (30.1%)		14 (26.9%)	17 (33.3%)	
Current smoker	9 (8.7%)		5 (9.6%)	4 (7.9%)	
e-cigarette	0 (0%)		0 (0%)	0 (0%)	
Other	0 (0%)		0 (0%)	0 (0%)	
Height (cm)	160.89 (15.03)	*0*	161.87 (15.84)	159.92 (14.26)	**0.513**
Weight (kg)	68.53 (24.78)	*0*	71.12 (29.08)	65.94 (19.51)	**0.289**
Body Mass Index (BMI)	25.94 (7.25)	*0*	26.71 (9.21)	25.17 (4.50)	**0.282**
Heart rate (bpm)	74.15 (12.02)	*39*	73.94 (12.21)	74.36 (12.01)	**0.888**
Systolic blood pressure (mmHg)	130.42 (19.95)	*25*	129.55 (19.17)	131.22 (20.85)	**0.713**
Diastolic blood pressure (mmHg)	74.84 (10.35)	*25*	75.89 (10.35)	73.90 (10.38)	**0.398**
Oxygen saturation (%)	94.68 (14.75)	*60*	97.10 (2.12)	92.48 (20.26)	**0.305**
Blood glucose (mg/dl)	140.77 (63.87)	*26*	152.76 (83.74)	129.95 (35.89)	**0.116**
HbA1c (%)	-	-	-	-	-
Creatinine (mg/dl)	-	-	-	-	-
Primary disease					
Primary disease CHF	34 (35.1%)	*6*	18 (36.0%)	16 (34.0%)	**0.673**
Primary disease COPD	42 (43.3%)	*6*	21 (42.0%)	21 (44.7%)	**0.663**
Primary disease DIABETES	21 (21.6%)	*6*	11 (22.0%)	10 (21.3%)	**0.685**
Secondary disease					
Secondary disease CHF	55 (56.1%)	*6*	30 (60.0%)	25 (52.1%)	**0.514**
Secondary disease COPD	14 (14.3%)	*6*	5 (10.0%)	9 (18.8%)	**0.327**
Secondary disease DIABETES	19 (19.4%)	*6*	12 (24.0%)	7 (14.6%)	**0.351**
Comorbidity ICD-10 codes					
Myocardial infarct	29 (29.0%)	*4*	15 (29.4%)	14 (28.6%)	**0.830**
Congestive heart failure	55 (57.9%)	*9*	33 (67.3%)	22 (47.8%)	**0.117**
Peripheral vascular disease	72 (73.5%)	*6*	37 (75.5%)	35 (71.4%)	**0.819**
Cerebrovascular disease	50 (53.2%)	*7*	29 (58.0%)	21 (44.7%)	**0.291**
Dementia	24 (23.8%)	*3*	15 (28.8%)	9 (18.4%)	**0.307**
Chronic pulmonary disease	40 (38.8%)	*1*	19 (36.5%)	21 (41.2%)	**0.629**
Rheumatic disease	36 (36.0%)	*4*	17 (32.7%)	19 (39.6%)	**0.160**
Peptic ulcer disease	13 (13.4%)	*7*	6 (11.8%)	7 (15.2%)	**0.206**
Mild liver disease	8 (8.0%)	*3*	5 (9.6%)	3 (6.1%)	**0.286**
Diabetes without chronic complication	75 (72.8%)	*1*	40 (76.9%)	35 (68.6%)	**0.344**
Diabetes with chronic complication	33 (32.4%)	*2*	21 (41.2%)	12 (23.5%)	**0.099**
Hemiplegia or paraplegia	7 (6.8%)	*1*	4 (7.7%)	3 (5.9%)	**0.715**
Renal disease	14 (14.1%)	*5*	10 (20.0%)	4 (8.2%)	**0.240**
Any malignancy	6 (6.6%)	*13*	4 (8.5%)	2 (4.5%)	**0.606**
Moderate or severe liver disease	7 (7.1%)	*5*	4 (8.3%)	3 (6.1%)	**0.936**
Metastatic solid tumour	2 (2.2%)	*15*	2 (4.5%)	0 (0%)	**0.304**
Barthel index. median (IQR)	95 (85,100)	*0*	95 (85,100)	95 (90,100)	**0.359**
GDS - Geriatric Depression Scale (Short Form)	4.09 (3.25)	*0*	3.81 (3.21)	4.36 (3.29)	**0.407**

Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%). unless otherwise indicated.

3.4.2.2 Analysis of demographic and clinical indicators, by group and gender

Gender-wise some differences were observed. There was a significant difference between males and females in control group for marital status (p=,016) meaning that there is significant association between gender and marital status; in this case women are more often widows than men. We observed the same conclusion on the following variables: education (control): women have higher percentage of only primary school or no school finished, while men have higher percentage in higher education; mobile use (in intervention): men use mobile phone more than women; tobacco use (control): women

have a higher percentage never smoking, while men have the same in being a former smoker; height (intervention and control); weight (control); primary disease CHF (men have higher percentage than women) and primary disease diabetes (intervention): women rate higher than men; and secondary disease CHF (intervention): women rate higher than men.

Table 5: Croatia: Baseline characteristics by group and by gender

Measurement	Intervention			Control		
	Male	Female	p-value	Male	Female	p-value
Sample size (n)	*22*	*27*		*20*	*30*	
Age	78.14 (6.11)	75.77 (6.92)	**0.220**	76.80 (7.40)	79.20 (7.08)	**0.254**
Marital status			**0.533**			**0.016**
Never married	0 (0%)	1 (3.7%)		0 (0%)	1	
Currently married	17 (77.3%)	18 (66.7%)		15 (75.0%)	10	
Separated	0 (0%)	0 (0%)		0 (0%)	0	
Divorced	1 (4.5%)	1 (3.7%)		1 (5.0%)	1	
Widowed	3 (13.6%)	7 (25.9%)		3 (15.0%)	18	
Cohabitating	1 (4.5%)	0 (0%)		1 (5.0%)	0	
Education			**0.290**			**0.011**
Less than primary school	1 (4.5%)	4 (14.8%)		0 (0%)	2 (6.7%)	
Primary school	1 (4.5%)	3 (11.1%)		0 (0%)	8 (26.7%)	
Secondary school	1 (4.5%)	2 (7.4%)		1 (5.0%)	6 (20.0%)	
High school	10 (45.5%)	13 (48.1%)		11 (55.0%)	9 (30.0%)	
College/University	6 (27.3%)	5 (18.5%)		8 (40.0%)	5 (16.7%)	
Post graduate degree	3 (13.6%)	0 (0%)		0 (0%)	0 (0%)	
Longest held occupation			**0.067**			**0.163**
Manual	7 (33.3%)	10 (43.5%)		11 (55.0%)	8 (28.6%)	
Non manual	14 (66.7%)	10 (43.5%)		9 (45.0%)	14 (50.0%)	
Unemployed (but able to work)	0 (0%)	0 (0%)		0 (0%)	1 (3.4%)	
Unemployed (unable to work)	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Homemaker	0 (0%)	3 (13.0%)		0 (0%)	5 (17.9%)	
Household income (euro/year)						
0-6.999						
7.000-13.999	-	-	**-**	-	-	**-**
14.000-19.999						
2<0.001 or more						
Housing tenure			**0.831**			**0.333**
Owners	20 (95.2%)	23 (92.0%)		17 (100.0%)	27 (96.4%)	
Renters	1 (4.8%)	2 (8.0%)		0 (0%)	1 (3.6%)	
People older than 18 living in household, median (IQR)	2 (2,2)	2 (2,5)	**0.064**	2.5 (2,3)	2 (1,3)	**0.440**
Mobile use (Yes)	18 (81.8%)	13 (48.1%)	**0.015**	18 (90.0%)	20 (66.7%)	**0.058**
PC use (Yes)	13 (48.1%)	7 (25.9%)	**0.430**	6 (30.0%)	5 (16.7%)	**0.265**
Alcohol						
None						
Less than 1/week						
1-7/week	-	-	**-**	-	-	**-**
8-14/week						
15-21/week						
More than 21/week						
Tobacco use			**0.160**			**<0.001**
Never	12 (54.5%)	18 (66.7%)		4 (20.0%)	25 (83.3%)	
Former	9 (40.9%)	5 (18.5%)		13 (65.0%)	4 (13.3%)	
Current smoker	1 (4.5%)	4 (14.8%)		3 (15.0%)	1 (3.3%)	
e-cigarette	0 (0%)	0 (0%)		0 (0%)	0 (0%)	

Measurement	Intervention			Control		
	Male	Female	p-value	Male	Female	p-value
Other	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Height (cm)	172.32 (14.50)	155.78 (11.71)	**<0.001**	171.10 (11.70)	153.80 (10.76)	**<0.001**
Weight (kg)	78.59 (26.39)	68.48 (30.50)	**0.227**	78.65 (17.32)	59.20 (16.38)	**<0.001**
Body Mass Index (BMI)	26.43 (8.58)	27.63 (10.07)	**0.660**	26.59 (4.60)	24.54 (4.29)	**0.114**
Heart rate (bpm)	72.38 (10.40)	75.50 (13.96)	**0.478**	73.71 (12.64)	75.06 (11.67)	**0.751**
Systolic blood pressure (mmHg)	128.84 (19.15)	130.26 (19.68)	**0.823**	132.63 (21.62)	130.00 (20.59)	**0.693**
Diastolic blood pressure (mmHg)	75.17 (10.95)	76.58 (10.00)	**0.684**	72.37 (10.05)	75.17 (10.69)	**0.390**
Oxygen saturation (%)	97.58 (1.08)	96.44 (2.96)	**0.298**	88.08 (27.80)	97.27 (2.24)	**0.288**
Blood glucose (mg/dl)	150.30 (89.77)	155.65 (78.70)	**0.848**	138.32 (33.43)	122.73 (37.11)	**0.168**
HbA1c (%)	-	-	**-**	-	-	**-**
Creatinine (mg/dl)	-	-	**-**	-	-	**-**
Primary disease						
Primary disease CHF	11 (55.0%)	5 (18.5%)	**0.010**	5 (29.4%)	11 (37.9%)	**0.279**
Primary disease COPD	8 (40.0%)	13 (48.1%)	**0.239**	9 (52.9%)	12 (41.4%)	**0.249**
Primary disease DIABETES	1 (5.0%)	9 (33.3%)	**0.018**	3 (17.7%)	6 (20.7%)	**0.320**
Secondary disease						
Secondary disease CHF	9 (45.0%)	20 (74.1%)	**0.037**	10 (58.8%)	15 (51.8%)	**0.297**
Secondary disease COPD	3 (15.0%)	1 (3.7%)	**0.110**	4 (23.5%)	4 (13.8%)	**0.234**
Secondary disease DIABETES	6 (30.0%)	5 (18.5%)	**0.183**	1 (5.9%)	6 (20.7%)	**0.136**
Comorbidity ICD-10 codes						
Myocardial infarct	6 (28.6%)	7 (25.9%)	**0.523**	6 (30.0%)	8 (26.7%)	**0.496**
Congestive heart failure	16 (80.0%)	16 (59.3%)	**0.090**	10 (52.6%)	12 (46.1%)	**0.573**
Peripheral vascular disease	16 (80.0%)	18 (69.2%)	**0.525**	14 (70.0%)	21 (70.0%)	**0.463**
Cerebrovascular disease	13 (65.0%)	13 (48.1%)	**0.145**	7 (5.6%)	13 (46.4%)	**0.805**
Dementia	8 (36.4%)	5 (18.5%)	**0.159**	2 (10.0%)	6 (21.4%)	**0.475**
Chronic pulmonary disease	6 (27.3%)	11 (40.7%)	**0.325**	9 (45.0%)	11 (36.7%)	**0.556**
Rheumatic disease	4 (18.2%)	11 (40.7%)	**0.088**	4 (20.0%)	15 (53.6%)	**0.080**
Peptic ulcer disease	3 (13.6%)	2 (7.4%)	**0.526**	4 (20.0%)	3 (10.0%)	**0.119**
Mild liver disease	2 (9.1%)	2 (7.4%)	**0.830**	2 (10.0%)	1 (3.6%)	**0.329**
Diabetes without chronic complication	18 (81.8%)	21 (77.8%)	**0.720**	14 (70.0%)	21 (70.0%)	**01.0**
Diabetes with chronic complication	10 (45.5%)	11 (40.7%)	**0.477**	5 (25.0%)	7 (23.3%)	**0.892**
Hemiplegia or paraplegia	3 (13.6%)	1 (3.7%)	**0.207**	2 (10.0%)	1 (3.3%)	**0.331**
Renal disease	2 (19.0%)	7 (26.9%)	**0.318**	3 (15.0%)	1 (3.3%)	**0.182**
Any malignancy	3 (15.0%)	1 (4.2%)	**0.448**	2 (10.5%)	0 (0%)	**0.084**
Moderate or severe liver disease	1 (5.0%)	2 (7.4%)	**0.263**	2 (10.0%)	1 (3.6%)	**0.329**
Metastatic solid tumor	1 (5.6%)	1 (4.3%)	**0.936**	0 (0%)	0 (0%)	**0.214**
Barthel index, median (IQR)	90 (80,100)	95 (85,100)	**0.927**	100 (95,100)	95 (82.5,100)	**0.266**
GDS - Geriatric Depression Scale (Short Form)	4.90 (4.01)	3.08 (2.30)	**0.080**	3.20 (2.04)	4.90 (3.58)	**0.062**
Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.						

3.4.2.3 Analysis of PIRU by group

Regarding the baseline PIRU questionnaire, we see that most of the patients from both groups are very satisfied with care in the sense of their involvement or involvement of their carers and family, and are of the opinion that all of their needs were assessed (72% intervention and 81,2% control group). Concerning questions that are connected with social or care staff, patients show that they know that staff are taking good care of them, and that they work together. Almost every patient thinks that the healthcare professional who co-ordinates their care and support understands them and their condition (89,6% in

intervention and 85,4% in control group). They also think that their care, support, treatment and medicine are reviewed often.

For analysis we used student's t-test for quantitative variables and χ^2 test for qualitative variables. Regarding statistical difference we only found one, in the variable "Were your family or carer involved in decisions about your treatment as much as you wanted them to be?". Here value of p was less than 0.05 (p=0,011). Results suggest that the groups differ in their results: the control group indicated fewer members of family and carers participated in their treatment than in the intervention group.

Table 6: Croatia: Baseline PIRU questionnaire by group

Measurement	Total	missing	Intervention	Control	p-value
Have all your needs been assessed?		*3*			**0.160**
All of my needs have been assessed	75 (76.5%)		36 (72.0%)	39 (81.2%)	
Some of my needs have been assessed	18 (18.4%)		11 (22.0%)	7 (14.6%)	
None of my needs have been assessed	3 (3.1%)		2 (4.0%)	1 (2.1%)	
Don't know/can't remember	2 (2.0%)		1 (2.0%)	1 (2.1%)	
Were you involved as much as you wanted to be in decisions about your care and support?					
		1			**0.874**
Yes, definitely	64 (64.0%)		31 (62.0%)	33 (66.0%)	
Yes, to some extent	29 (29.0%)		16 (32.0%)	13 (26.0%)	
No	7 (7.0%)		3 (6.0%)	4 (8.0%)	
Were you involved as much as you wanted to be in decisions about your treatment?					
		1			**0.743**
Yes, definitely	64 (64.0%)		31 (62.0%)	33 (66.0%)	
Yes, to some extent	30 (30.0%)		16 (32.0%)	14 (28.0%)	
No	6 (6.0%)		3 (6.0%)	3 (6.0%)	
Were your family or carer involved in decisions about your care and support as much as you wanted them to be?					
		1			**0.052**
Yes, definitely	70 (70.0%)		37 (74.0%)	33 (66.0%)	
Yes, to some extent	15 (15.0%)		10 (20.0%)	5 (10.0%)	
No	7 (7.0%)		2 (4.0%)	5 (10.0%)	
There were no family or carers available to be involved	5 (5.0%)		0 (0%)	5 (10.0%)	
I didn't want my family or carer to be involved in decisions about my care and support	3 (3.0%)		1 (2.0%)	2 (4.0%)	
Were your family or carer involved in decisions about your treatment as much as you wanted them to be?					
		1			**0.011**
Yes, definitely	70 (70.0%)		39 (78.0%)	31 (62.0%)	
Yes, to some extent	16 (16.0%)		9 (18.0%)	7 (14.0%)	
No	5 (5.0%)		1 (2.0%)	4 (8.0%)	
There were no family or carers available to be involved	5 (5.0%)		0 (0%)	5 (10.0%)	
I didn't want my family or carer to be involved in decisions about my treatment and support	4 (4.0%)		1 (2.0%)	3 (6.0%)	

Measurement	Total	missing	Intervention	Control	p-value
Overall, do you feel that your carer/family has had as much support from health and social services as they needed?					
		3			**0.159**
Yes, they have had as much support as they needed	75 (76.5%)		43 (86.0%)	32 (66.6%)	
They have had some support but not as much as they needed	13 (13.3%)		4 (8.0%)	9 (18.8%)	
No, they have had little or no support	3 (3.1%)		2 (4.0%)	1 (2.1%)	
They did not want/need support	2 (2.0%)		1 (2.0%)	1 (2.1%)	
There are no family members or carers to support	5 (5.1%)		0 (0%)	5 (10.4%)	
To what extent do you agree or disagree with the following statement...'Health and social care staff always tell me what will happen next'					
		3			**0.934**
Strongly agree	25 (25.5%)		12 (24.5%)	13 (26.5%)	
Agree	39 (39.8%)		20 (40.8%)	19 (38.8%)	
Neither agree nor disagree	25 (25.5%)		15 (30.6%)	10 (20.4%)	
Disagree	9 (9.2%)		2 (4.1%)	7 (14.3%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
When health or social care staff plan care or treatment for you, does it happen?					
		6			**0.747**
Yes, it happens all of the time	59 (62.1%)		29 (61.7%)	30 (62.4%)	
It happens most of the time	31 (32.7%)		16 (34.0%)	15 (31.3%)	
It happens some of the time	4 (4.2%)		2 (4.3%)	2 (4.2%)	
No	1 (1.0%)		0 (0%)	1 (2.1%)	
To what extent do you agree or disagree with the following statement...'My care and support is reviewed as often as it should be'					
		3			**0.160**
Strongly agree	39 (39.8%)		20 (40.0%)	19 (39.6%)	
Agree	42 (42.8%)		23 (46.0%)	19 (39.6%)	
Neither agree nor disagree	14 (14.3%)		6 (12.0%)	8 (16.6%)	
Disagree	3 (3.1%)		1 (2.0%)	2 (4.2%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
To what extent do you agree or disagree with the following statement...'My treatment is reviewed as often as it should be'					
		2			**0.322**
Strongly agree	42 (42.4%)		21 (42.0%)	21 (42.8%)	
Agree	40 (40.4%)		21 (42.0%)	19 (38.8%)	
Neither agree nor disagree	15 (15.2%)		8 (16.0%)	7 (14.3%)	
Disagree	2 (2.0%)		0 (0%)	2 (4.1%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
To what extent do you agree or disagree with the following statement...'My medicines are thoroughly reviewed as often as they should be'					
		1			**0.638**
Strongly agree	39 (39.0%)		17 (34.0%)	22 (44.0%)	
Agree	37 (37.0%)		22 (44.0%)	15 (30.0%)	
Neither agree nor disagree	21 (21.0%)		9 (18.0%)	12 (24.0%)	
Disagree	3 (3.0%)		2 (4.0%)	1 (2.0%)	

Measurement	Total	missing	Intervention	Control	p-value
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
Do you have a named health or social care professional who co-ordinates your care and support?					
		2			**0.322**
Yes	85 (85.9%)		42 (85.7%)	43 (86.0%)	
No, I co-ordinate my own care and support	10 (10.1%)		5 (10.2%)	5 (10.0%)	
Don't know/not sure	4 (4.0%)		2 (4.1%)	2 (4.0%)	
If you have questions, when can you contact the people treating and caring for you? Please tick ALL the apply					
		6			**0.636**
During normal working hours	92 (96.8%)		46 (95.8%)	46 (97.9%)	
During the evening	0 (0%)		0 (0%)	0 (0%)	
During the night	0 (0%)		0 (0%)	0 (0%)	
Weekends	0 (0%)		0 (0%)	0 (0%)	
Don't know/not sure	3 (3.2%)		2 (4.2%)	1 (2.1%)	
Do you feel this person understands about you and your condition?					
		6			**0.681**
Yes, definitely	83 (87.3%)		43 (89.6%)	40 (85.1%)	
Yes, to some extent	11 (11.6%)		5 (10.4%)	6 (12.8%)	
No	1 (1.1%)		0 (0%)	1 (2.1%)	
Do all the different people treating and caring for you work well together to give you the best possible care and support?					
		8			**0.054**
Yes, all of them work well together	67 (72.0%)		35 (71.4%)	32 (72.7%)	
Most of them work well together	17 (18.3%)		9 (18.4%)	8 (18.2%)	
Some of them work well together	4 (4.3%)		1 (2.0%)	3 (6.8%)	
No, they do not work well together	1 (1.1%)		0 (0%)	1 (2.3%)	
Don't know/not sure	4 (4.3%)		4 (8.2%)	0 (0%)	
Do health and social care services help you live the life you want as far as possible?					
		5			**0.954**
Yes, definitely	57 (59.3%)		28 (58.3%)	29 (60.4%)	
Yes, to some extent	33 (34.4%)		18 (37.5%)	15 (31.3%)	
No	6 (6.3%)		2 (4.2%)	4 (8.3%)	
To what extent do you agree or disagree with the following statement…'In the last 12 months, health and social care staff have given me information about other services that are available to someone in my circumstances, including support organisations'					
		2			**0.322**
Strongly agree	30 (30.3%)		14 (28.0%)	16 (32.7%)	
Agree	33 (33.3%)		22 (44.0%)	11 (22.4%)	
Neither agree nor disagree	26 (26.3%)		10 (20.0%)	16 (32.7%)	
Disagree	10 (10.1%)		4 (8.0%)	6 (12.2%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	

3.4.3 Lower Silesia

3.4.3.1 Analysis of demographic and clinical indicators, by group

The total number of patients (100) has been recruited for LSV Pilot site; 50 patients have been assigned to the intervention group, and 50 to the control group.

Participants have a mean age of 74.49 years, being a bit older in the control group, but without statistical significance. Looking at gender distribution, there are differences between groups: 64% female in intervention group but 62% male in control group; the proportions are reversed.

The average age in the control group is higher by almost two years, but it is not statistically significant.

Education level is comparable, with most participants having completed secondary school education. The enrolment in both groups seems to be appropriate. Household income was not recorded - it is regarded as a privacy issue.

More surprising is over-representation in the control group of patients with congestive heart failure: 52% comparing to 4% in intervention group, similarly with dementia (but in reverse proportion).

There is a small difference in mobile and PC use between groups, though subjects familiar with the mobile phone are quite few (36%), but high with PCs (92%).

With regard to health related living habits, some of the participants present a moderate pattern of alcohol consumption (55,6% less than 1/week). Most participants have never smoked (49%), nor are former smokers, without differences between groups. There are some current smokers (11%); eight smokers in intervention group and three in control group.

Regarding the clinical control parameters which were assessed, there were no differences between control and intervention groups. There are missing values for HbA1c (All) and creatinine levels (37); this is because these parameters are not relevant for the disease concerned.

For primary and secondary diseases, results are comparable between groups. Diabetes is the prevalent primary disease, for both intervention and control groups, and Congestive Heart Failure the most prevalent secondary disease.

Another significant characteristic of participants is their level of functional dependence, measured by Barthel Index. In this case, there are no differences between intervention and control groups; all present a median of 100, indicating autonomy.

For the baseline mental health, both groups present mean values corresponding to normality.

Table 7: Lower Silesia: Baseline characteristics by group

Measurement	Total	Missing	Intervention	Control	p-value
Sample size (n)	*100*		*50*	*50*	
Age	74.49 (6.67)	*0*	73.76 (6.66)	75.22 (6.66)	**0.276**
Gender		*0*			**0.016**
Female	51 (51%)		32 (64%)	19 (38%)	
Male	49 (49%)		18 (36%)	31 (62%)	
Marital status					
Never married					
Currently married					
Separated	-	-	-	-	-
Divorced					

Measurement	Total	Missing	Intervention	Control	p-value
Widowed Cohabitating					
Education Less than primary school Primary school Secondary school High school College/University Post graduate degree	 30 (30%) 53 (53%) 13 (13%) 0 (0%) 4 (4%)	*0*	 14 (28%) 28 (56%) 8 (16%) 0 (0%) 0 (0%)	 16 (32%) 25 (50%) 5 (10%) 0 (0%) 4 (8%)	**0.199**
Longest held occupation Manual Non manual Unemployed (but able to work) Unemployed (unable to work) Homemaker	 77 (77%) 23 (23%) 0 (0%) 0 (0%) 0 (0%)	*0*	 39 (78%) 11 (22%) 0 (0%) 0 (0%) 0 (0%)	 38 (76%) 12 (24%) 0 (0%) 0 (0%) 0 (0%)	**1.000**
Household income (euro/year) 0-6.999 7.000-13.999 14.000-19.999 20.000 or more	 -	 -	 -	 -	 **-**
Housing tenure Owners Renters	 95 (96%) 4 (4%)	*1*	 49 (98%) 1 (2%)	 46 (93.9%) 3 (6.1%)	**0.362**
People older than 18 living in household, median (IQR)	1 (1,2)	*0*	2 (1,3)	1 (1,2)	**0.139**
Mobile use (Yes)	36 (36%)	*0*	22 (44%)	14 (28%)	**0.145**
PC use (Yes)	92 (92%)	*0*	48 (96%)	44 (88%)	**0.269**
Alcohol None Less than 1/week 1-7/week 8-14/week 15-21/week More than 21/week	 8 (8.1%) 55 (55.6%) 3 (3%) 2 (2%) 1 (1%) 30 (30.3%)	*1*	 0 (0%) 24 (48%) 1 (2%) 2 (4%) 0 (0%) 23 (46%)	 8 (16.3%) 31 (63.3%) 2 (4.1%) 0 (0%) 1 (2%) 7 (14.3%)	**<0.001**
Tobacco use Never Former Current smoker e-cigarette Other	 48 (49%) 39 (39.8%) 11 (11.2%) 0 (0%) 0 (0%)	*2*	 21 (42.9%) 20 (40.8%) 8 (16.3%) 0 (0%) 0 (0%)	 27 (55.1%) 19 (38.8%) 3 (6.1%) 0 (0%) 0 (0%)	**0.218**
Height (cm)	166.41 (9.07)	*0*	167.84 (8.68)	164.98 (9.31)	**0.115**
Weight (kg)	80.79 (12.51)	*0*	81.94 (12.58)	79.64 (12.47)	**0.361**
Body Mass Index (BMI)	29.2 (4.24)	*0*	29.18 (4.72)	29.23 (3.75)	**0.955**
Heart rate (bpm)	74.11 (6.57)	*0*	74.52 (3.36)	73.7 (8.69)	**0.536**
Systolic blood pressure (mmHg)	130.05 (7.86)	*0*	127.7 (7.12)	132.4 (7.93)	**0.002**
Diastolic blood pressure (mmHg)	79.95 (5.5)	*0*	79.62 (4.34)	80.28 (6.48)	**0.551**
Oxygen saturation (%)	94.4 (2.42)	*0*	93.52 (1.94)	95.28 (2.54)	**<0.001**
Blood glucose (mg/dl)	120.75 (45.89)	*0*	118.96 (37.62)	122.54 (53.24)	**0.699**
HbA1c (%)	-	-	-	-	**-**
Creatinine (mg/dl)	0.96 (0.3)	*37*	0.97 (0.3)	0.95 (0.32)	**0.877**
Primary disease Primary disease CHF Primary disease COPD Primary disease DIABETES	 23 (23%) 8 (8%) 38 (38%)	 *0* *0* *0*	 10 (20%) 5 (10%) 20 (40%)	 13 (26%) 3 (6%) 18 (36%)	 **0.635** **0.715** **0.837**

Measurement	Total	Missing	Intervention	Control	p-value
Secondary disease					
Secondary disease CHF	31 (31%)	*0*	15 (30%)	16 (32%)	**1.000**
Secondary disease COPD	0 (0%)	*0*	0 (0%)	0 (0%)	**1.000**
Secondary disease DIABETES	4 (4%)	*0*	1 (2%)	3 (6%)	**0.617**
Comorbidity ICD-10 codes					
Myocardial infarct	4 (4%)	*0*	0 (0%)	4 (8%)	**0.117**
Congestive heart failure	28 (28%)	*0*	2 (4%)	26 (52%)	**<0.001**
Peripheral vascular disease	1 (1%)	*1*	1 (2%)	0 (0%)	**1.000**
Cerebrovascular disease	10 (10.1%)	*1*	8 (16%)	2 (4.1%)	**0.092**
Dementia	23 (23.2%)	*1*	18 (36%)	5 (10.2%)	**0.005**
Chronic pulmonary disease	5 (5.1%)	*1*	4 (8%)	1 (2%)	**0.362**
Rheumatic disease	0 (0%)	*1*	0 (0%)	0 (0%)	**1.000**
Peptic ulcer disease	7 (7.1%)	*1*	4 (8%)	3 (6.1%)	**1.000**
Mild liver disease	1 (1%)	*1*	0 (0%)	1 (2%)	**0.495**
Diabetes without chronic complication	1 (1%)	*1*	0 (0%)	1 (2%)	**0.495**
Diabetes with chronic complication	0 (0%)	*1*	0 (0%)	0 (0%)	**1.000**
Hemiplegia or paraplegia	13 (13.1%)	*1*	8 (16%)	5 (10.2%)	**0.578**
Renal disease	13 (13.1%)	*1*	8 (16%)	5 (10.2%)	**0.578**
Any malignancy	0 (0%)	*1*	0 (0%)	0 (0%)	**0.920**
Moderate or severe liver disease	14 (14.1%)	*1*	9 (18%)	5 (10.2%)	**0.410**
Metastatic solid tumour	0 (0%)	*1*	0 (0%)	0 (0%)	**1.000**
Barthel index, median (IQR)	100 (100,100)	*0*	100 (100,100)	100 (100,100)	**0.421**
GDS - Geriatric Depression Scale (Short Form)	1.35 (4.31)	*0*	1.2 (4.11)	1.5 (4.55)	**0.730**
Iadl, median (IQR)	7.5 (6,8)	*0*	6.5 (5,8)	8 (7,8)	**0.001**
Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.					

3.4.3.2 Analysis of demographic and clinical indicators, by group and gender

In order to evaluate the effect of gender on the baseline situation, additional analyses were carried out.

Age distribution within groups is similar. In both groups, alcohol consumption is similar for men and women, and also for consumption of tobacco. There are also expected differences in height, weight and BMI.

In clinical data there were no significant differences; Diabetes is a condition essential for men in the control group and the women in the intervention. Similarly CHF and the state of mental health are examined. All of these variations are presented in Table 8.

Table 8: Lower Silesia: Baseline characteristics by group and by gender

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Sample size (n)	*32*	*18*		*19*	*31*	
Age	73.88 (6.89)	73.56 (6.42)	**0.870**	75.21 (6.93)	75.23 (6.6)	**0.994**
Marital status Never married Currently married Separated Divorced Widowed Cohabitating	-	-	**-**	-	-	**-**

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Education			**0.919**			**0.116**
Less than primary school						
Primary school	10 (31.2%)	4 (22.2%)		3 (15.8%)	13 (41.9%)	
Secondary school	17 (53.1%)	11 (61.1%)		13 (68.4%)	12 (38.7%)	
High school	5 (15.6%)	3 (16.7%)		1 (5.3%)	4 (12.9%)	
College/University	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Post graduate degree	0 (0%)	0 (0%)		2 (10.5%)	2 (6.5%)	
Longest held occupation			**1.000**			**1.000**
Manual	25 (78.1%)	14 (77.8%)		14 (73.7%)	24 (77.4%)	
Non manual	7 (21.9%)	4 (22.2%)		5 (26.3%)	7 (22.6%)	
Unemployed (but able to work)	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Unemployed (unable to work)	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Homemaker	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Household income (euro/year)						
0-6.999						
7.000-13.999	-	-	**-**	-	-	**-**
14.000-19.999						
20.000 or more						
Housing tenure			**0.360**			**0.273**
Owners	32 (100%)	17 (94.4%)		19 (100%)	27 (90%)	
Renters	0 (0%)	1 (5.6%)		0 (0%)	3 (10%)	
People older than 18 living in household, median (IQR)	2 (1,3)	1 (1,2.8)	**0.263**	1 (1,2)	1 (1,2)	**0.717**
Mobile use (Yes)	14 (43.8%)	8 (44.4%)	**1.000**	6 (31.6%)	8 (25.8%)	**0.907**
PC use (Yes)	30 (93.8%)	18 (100%)	**0.530**	18 (94.7%)	26 (83.9%)	**0.387**
Alcohol			**0.167**			**0.054**
None	0 (0%)	0 (0%)		1 (5.6%)	7 (22.6%)	
Less than 1/week	13 (40.6%)	11 (61.1%)		10 (55.6%)	21 (67.7%)	
1-7/week	0 (0%)	1 (5.6%)		2 (11.1%)	0 (0%)	
8-14/week	2 (6.2%)	0 (0%)		0 (0%)	0 (0%)	
15-21/week	0 (0%)	0 (0%)		1 (5.6%)	0 (0%)	
More than 21/week	17 (53.1%)	6 (33.3%)		4 (22.2%)	3 (9.7%)	
Tobacco use			**0.006**			**0.002**
Never	8 (25.8%)	13 (72.2%)		5 (27.8%)	22 (71%)	
Former	17 (54.8%)	3 (16.7%)		10 (55.6%)	9 (29%)	
Current smoker	6 (19.4%)	2 (11.1%)		3 (16.7%)	0 (0%)	
e-cigarette	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Other	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Height (cm)	171.81 (7.28)	160.78 (6.16)	**<0.001**	173.11 (8.61)	160 (5.43)	**<0.001**
Weight (kg)	83.66 (13.37)	78.89 (10.7)	**0.175**	85.53 (10.15)	76.03 (12.52)	**0.005**
Body Mass Index (BMI)	28.38 (4.68)	30.61 (4.56)	**0.109**	28.59 (3.2)	29.61 (4.06)	**0.329**
Heart rate (bpm)	73.94 (3.26)	75.56 (3.38)	**0.109**	74.47 (8.05)	73.23 (9.15)	**0.616**
Systolic blood pressure (mmHg)	127.56 (7.45)	127.94 (6.7)	**0.854**	130.74 (9.17)	133.42 (7.03)	**0.283**
Diastolic blood pressure (mmHg)	78.78 (4.15)	81.11 (4.39)	**0.075**	79 (5.36)	81.06 (7.04)	**0.248**
Oxygen saturation (%)	93.38 (2.06)	93.78 (1.73)	**0.466**	95.26 (2.94)	95.29 (2.31)	**0.973**
Blood glucose (mg/dl)	120.19 (36.13)	116.78 (41.12)	**0.771**	130.63 (68.48)	117.58 (41.82)	**0.460**
HbA1c (%)	-	-	**-**	-	-	**-**
Creatinine (mg/dl)	1.04 (0.3)	0.82 (0.24)	**0.016**	1.14 (0.34)	0.77 (0.12)	**0.003**
Primary disease						
Primary disease CHF	7 (21.9%)	3 (16.7%)	**0.73**	5 (26.3%)	8 (25.8%)	**1.000**
Primary disease COPD	4 (12.5%)	1 (5.6%)	**0.642**	3 (15.8%)	0 (0%)	**0.049**

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Primary disease DIABETES	11 (34.4%)	9 (50%)	**0.434**	6 (31.6%)	12 (38.7%)	**0.836**
Secondary disease						
Secondary disease CHF	10 (31.2%)	5 (27.8%)	**1.000**	5 (26.3%)	11 (35.5%)	**0.717**
Secondary disease COPD	0 (0%)	0 (0%)	**1.000**	0 (0%)	0 (0%)	**1.000**
Secondary disease DIABETES	1 (3.1%)	0 (0%)	**1.000**	1 (5.3%)	2 (6.5%)	**1.000**
Comorbidity ICD-10 codes						
Myocardial infarct	0 (0%)	0 (0%)	**1.000**	3 (15.8%)	1 (3.2%)	**0.147**
Congestive heart failure	1 (3.1%)	1 (5.6%)	**1.000**	9 (47.4%)	17 (54.8%)	**0.825**
Peripheral vascular disease	1 (3.1%)	0 (0%)	**1.000**	0 (0%)	0 (0%)	**1.000**
Cerebrovascular disease	3 (9.4%)	5 (27.8%)	**0.118**	1 (5.3%)	1 (3.3%)	**1.000**
Dementia	14 (43.8%)	4 (22.2%)	**0.224**	3 (15.8%)	2 (6.7%)	**0.363**
Chronic pulmonary disease	2 (6.2%)	2 (11.1%)	**0.612**	1 (5.3%)	0 (0%)	**0.388**
Rheumatic disease	0 (0%)	0 (0%)	**1.000**	0 (0%)	0 (0%)	**1.000**
Peptic ulcer disease	3 (9.4%)	1 (5.6%)	**1.000**	1 (5.3%)	2 (6.7%)	**1.000**
Mild liver disease	0 (0%)	0 (0%)	**1.000**	0 (0%)	1 (3.3%)	**1.000**
Diabetes without chronic complication	0 (0%)	0 (0%)	**1.000**	0 (0%)	1 (3.3%)	**1.000**
Diabetes with chronic complication	0 (0%)	0 (0%)	**1.000**	0 (0%)	0 (0%)	**1.000**
Hemiplegia or paraplegia	6 (18.8%)	2 (11.1%)	**0.694**	4 (21.1%)	1 (3.3%)	**0.067**
Renal disease	6 (18.8%)	2 (11.1%)	**0.694**	4 (21.1%)	1 (3.3%)	**0.067**
Any malignancy	0 (0%)	0 (0%)	**1.000**	0 (0%)	0 (0%)	**1.000**
Moderate or severe liver disease	5 (15.6%)	4 (22.2%)	**0.705**	3 (15.8%)	2 (6.7%)	**0.363**
Metastatic solid tumor	0 (0%)	0 (0%)	**1.000**	0 (0%)	0 (0%)	**1.000**
Barthel index, median (IQR)	100 (100,100)	100 (100,100)	**0.284**	100 (100,100)	100 (100,100)	**0.045**
GDS - Geriatric Depression Scale (Short Form)	1.41 (4.44)	0.83 (3.54)	**0.619**	0.79 (3.44)	1.94 (5.11)	**0.349**
Iadl, median (IQR)	6 (5,8)	7 (6,8)	**0.057**	7 (5.5,8)	8 (8,8)	**0.007**
Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.						

3.4.3.3 Analysis of PIRU by group

Significant differences can be found between intervention and control groups in almost all the questions. In the intervention group, in general patients are more satisfied with traditional care than in the control group. The presence of this difference is probably unavoidable at this point; so the discussion of the results and analysis for PIRU questionnaire should be based on the differences found between pre and post values in order to avoid the introduction of bias.

Table 9: Lower Silesia: Baseline PIRU questionnaire by group

Measurement	Total	missing	Intervention	Control	p-value
Have all your needs been assessed?		*0*			**0.003**
All of my needs have been assessed	70 (70%)		38 (76%)	32 (64%)	
Some of my needs have been assessed	25 (25%)		7 (14%)	18 (36%)	
None of my needs have been assessed	0 (0%)		0 (0%)	0 (0%)	
Don't know/can't remember	5 (5%)		5 (10%)	0 (0%)	
Were you involved as much as you wanted to be in decisions about your care and support?					
		0			**<0.001**
Yes, definitely	70 (70%)		44 (88%)	26 (52%)	
Yes, to some extent	0 (0%)		0 (0%)	0 (0%)	
No	30 (30%)		6 (12%)	24 (48%)	

Measurement	Total	missing	Intervention	Control	p-value
Were you involved as much as you wanted to be in decisions about your treatment?					
		0			**0.082**
Yes, definitely	58 (58%)		34 (68%)	24 (48%)	
Yes, to some extent	40 (40%)		15 (30%)	25 (50%)	
No	2 (2%)		1 (2%)	1 (2%)	
Were your family or carer involved in decisions about your care and support as much as you wanted them to be?					
		0			**<0.001**
Yes, definitely	43 (43%)		32 (64%)	11 (22%)	
Yes, to some extent	45 (45%)		14 (28%)	31 (62%)	
No	1 (1%)		0 (0%)	1 (2%)	
There were no family or carers available to be involved	4 (4%)		3 (6%)	1 (2%)	
I didn't want my family or carer to be involved in decisions about my care and support	7 (7%)		1 (2%)	6 (12%)	
Were your family or carer involved in decisions about your treatment as much as you wanted them to be?					
		1			**0.040**
Yes, definitely	44 (44.4%)		29 (58%)	15 (30.6%)	
Yes, to some extent	41 (41.4%)		16 (32%)	25 (51%)	
No	1 (1%)		0 (0%)	1 (2%)	
There were no family or carers available to be involved	2 (2%)		1 (2%)	1 (2%)	
I didn't want my family or carer to be involved in decisions about my treatment and support	11 (11.1%)		4 (8%)	7 (14.3%)	
Overall, do you feel that your carer/family has had as much support from health and social services as they needed?					
		2			**0.001**
Yes, they have had as much support as they needed	44 (44.9%)		31 (63.3%)	13 (26.5%)	
They have had some support but not as much as they needed	34 (34.7%)		9 (18.4%)	25 (51%)	
No, they have had little or no support	4 (4.1%)		1 (2%)	3 (6.1%)	
They did not want/need support	13 (13.3%)		7 (14.3%)	6 (12.2%)	
There are no family members or carers to support	3 (3.1%)		1 (2%)	2 (4.1%)	
To what extent do you agree or disagree with the following statement…'Health and social care staff always tell me what will happen next'					
		0			**<0.001**
Strongly agree	30 (30%)		24 (48%)	6 (12%)	
Agree	45 (45%)		20 (40%)	25 (50%)	
Neither agree nor disagree	20 (20%)		5 (10%)	15 (30%)	
Disagree	4 (4%)		0 (0%)	4 (8%)	
Strongly disagree	1 (1%)		1 (2%)	0 (0%)	
When health or social care staff plan care or treatment for you, does it happen?					
		0			**0.001**
Yes, it happens all of the time	46 (46%)		32 (64%)	14 (28%)	

Measurement	Total	missing	Intervention	Control	p-value
It happens most of the time	47 (47%)		16 (32%)	31 (62%)	
It happens some of the time	5 (5%)		2 (4%)	3 (6%)	
No	2 (2%)		0 (0%)	2 (4%)	
To what extent do you agree or disagree with the following statement…'My care and support is reviewed as often as it should be'					
		1			**<0.001**
Strongly agree	51 (51.5%)		35 (70%)	16 (32.7%)	
Agree	38 (38.4%)		9 (18%)	29 (59.2%)	
Neither agree nor disagree	7 (7.1%)		5 (10%)	2 (4.1%)	
Disagree	2 (2%)		0 (0%)	2 (4.1%)	
Strongly disagree	1 (1%)		1 (2%)	0 (0%)	
To what extent do you agree or disagree with the following statement…'My treatment is reviewed as often as it should be'					
		0			**0.001**
Strongly agree	52 (52%)		35 (70%)	17 (34%)	
Agree	39 (39%)		11 (22%)	28 (56%)	
Neither agree nor disagree	5 (5%)		3 (6%)	2 (4%)	
Disagree	3 (3%)		1 (2%)	2 (4%)	
Strongly disagree	1 (1%)		0 (0%)	1 (2%)	
To what extent do you agree or disagree with the following statement…'My medicines are thoroughly reviewed as often as they should be'					
		0			**<0.001**
Strongly agree	53 (53%)		37 (74%)	16 (32%)	
Agree	38 (38%)		9 (18%)	29 (58%)	
Neither agree nor disagree	6 (6%)		3 (6%)	3 (6%)	
Disagree	2 (2%)		1 (2%)	1 (2%)	
Strongly disagree	1 (1%)		0 (0%)	1 (2%)	
Do you have a named health or social care professional who co-ordinates your care and support?					
		0			**0.495**
Yes	98 (98%)		50 (100%)	48 (96%)	
No, I co-ordinate my own care and support	2 (2%)		0 (0%)	2 (4%)	
Don't know/not sure	0 (0%)		0 (0%)	0 (0%)	
If you have questions, when can you contact the people treating and caring for you? Please tick ALL the apply					
		0			**0.436**
During normal working hours	93 (93%)		45 (90%)	48 (96%)	
During the evening	7 (7%)		5 (10%)	2 (4%)	
During the night	0 (0%)		0 (0%)	0 (0%)	
Weekends	0 (0%)		0 (0%)	0 (0%)	
Don't know/not sure	0 (0%)		0 (0%)	0 (0%)	
Do you feel this person understands about you and your condition?					
		0			**0.027**
Yes, definitely	53 (53%)		32 (64%)	21 (42%)	
Yes, to some extent	46 (46%)		17 (34%)	29 (58%)	
No	1 (1%)		1 (2%)	0 (0%)	

Measurement	Total	missing	Intervention	Control	p-value
Do all the different people treating and caring for you work well together to give you the best possible care and support?					
		0			**0.032**
Yes, all of them work well together	52 (52%)		33 (66%)	19 (38%)	
Most of them work well together	39 (39%)		14 (28%)	25 (50%)	
Some of them work well together	7 (7%)		3 (6%)	4 (8%)	
No, they do not work well together	1 (1%)		0 (0%)	1 (2%)	
Don't know/not sure	1 (1%)		0 (0%)	1 (2%)	
Do health and social care services help you live the life you want as far as possible?					
		1			**0.002**
Yes, definitely	53 (53.5%)		35 (70%)	18 (36.7%)	
Yes, to some extent	45 (45.5%)		15 (30%)	30 (61.2%)	
No	1 (1%)		0 (0%)	1 (2%)	
To what extent do you agree or disagree with the following statement…'In the last 12 months, health and social care staff have given me information about other services that are available to someone in my circumstances, including support organisations'					
		0			**0.444**
Strongly agree	30 (30%)		18 (36%)	12 (24%)	
Agree	36 (36%)		18 (36%)	18 (36%)	
Neither agree nor disagree	28 (28%)		11 (22%)	17 (34%)	
Disagree	5 (5%)		2 (4%)	3 (6%)	
Strongly disagree	1 (1%)		1 (2%)	0 (0%)	

3.4.4 Veneto

The analysis of data refers to 161 patients.

3.4.4.1 Analysis of demographic and clinical indicators, by group

Baseline characteristics of these patients are similar between the two groups, as set out in Table 10. The only two statistically significant differences concern the "longest held occupation" and "oxygen saturation".

In relation to socio-demographic data, the intervention group is composed of 81 patients, 29 males and 52 females, with an average age of 84.21, while the control group is composed of 80 patients, 30 males and 50 females, with an average age of 83.51.

The majority of patients are widowed, but they lived in household with one person older than 18.

Both intervention and comparator groups are characterised by low educational attainment (primary school), and they declared that their longest held occupation is manual. Nevertheless, the 27,2% of patients of the intervention group and the 18,8% of the control group have homemaker as their longest held occupation. Almost of all participants are owners of their house.

Only four patients are able to use a personal computer, while the 41,8% of the control group and the 30,9% of the intervention group are able to use a mobile phone.

With regard to the clinical variables, the two groups can be considered homogeneous except for oxygen saturation (p=0.002). In this case the intervention group presents a mean value of 94,71% while the control group is 96,15%. In the intervention group, the majority of patients (35,8%) have diabetes as primary disease, while in the control group CHF is the most widespread primary disease (48,8%). With regard to secondary disease, the majority of patients (34,2%) are affected by cardiac heart failure.

The comorbidities include CHF (50.6% in the intervention group and 63.8% in the control group), COPD (46.8% in the intervention group and 45% in the control group) and peripheral vascular disease (42% in the intervention group and 37,2% in the control group).

The ability to perform daily activities is evaluated using the Barthel Index: both the intervention and comparator group achieved a mean score of about 70 out of 100. Moreover both groups report a mean of GDS score greater than 5 (6.49 for intervention group and 5.59 for the control group) so both group show mild depressive symptoms.

Table 10: Veneto: Baseline characteristics by group

Measurement	Total	Missing	Intervention	Control	p-value
Sample size (n)	*161*		*81*	*80*	
Age	83.86 (7.23)	*0*	84.21 (7.62)	83.51 (6.85)	**0.542**
Gender		*0*			**0.952**
Female	102 (63.4%)		52 (64.2%)	50 (62.5%)	
Male	59 (36.6%)		29 (35.8%)	30 (37.5%)	
Marital status		*1*			**0.767**
Never married	10 (6.2%)		4 (4.9%)	6 (7.6%)	
Currently married	64 (40%)		32 (39.5%)	32 (40.5%)	
Separated	0 (0%)		0 (0%)	0 (0%)	
Divorced	0 (0%)		0 (0%)	0 (0%)	
Widowed	86 (53.8%)		45 (55.6%)	41 (51.9%)	
Cohabitating	0 (0%)		0 (0%)	0 (0%)	
Education		*2*			**0.708**
Less than primary school	28 (17.6%)		16 (20%)	12 (15.2%)	
Primary school	107 (67.3%)		54 (67.5%)	53 (67.1%)	
Secondary school	20 (12.6%)		8 (10%)	12 (15.2%)	
High school	4 (2.5%)		2 (2.5%)	2 (2.5%)	
College/University	0 (0%)		0 (0%)	0 (0%)	
Post graduate degree	0 (0%)		0 (0%)	0 (0%)	
Longest held occupation		*0*			**0.029**
Manual	108 (67.1%)		56 (69.1%)	52 (65%)	
Non manual	15 (9.3%)		3 (3.7%)	12 (15%)	
Unemployed (but able to work)	1 (0.6%)		0 (0%)	1 (1.2%)	
Unemployed (unable to work)	0 (0%)		0 (0%)	0 (0%)	
Homemaker	37 (23%)		22 (27.2%)	15 (18.8%)	
Household income (euro/year)					
0-6.999					
7.000-13.999	-	-	-	-	-
14.000-19.999					
20.000 or more					
Housing tenure		*11*			**1.000**
Owners	136 (90.7%)		70 (90.9%)	66 (90.4%)	
Renters	14 (9.3%)		7 (9.1%)	7 (9.6%)	
People older than 18 living in household, median (IQR)	1 (0,1)	*5*	1 (1,1)	1 (0,1.2)	**0.977**
Mobile use (Yes)	58 (36.2%)	*1*	25 (30.9%)	33 (41.8%)	**0.204**
PC use (Yes)	4 (2.5%)	*0*	2 (2.5%)	2 (2.5%)	**1.000**
Alcohol		*2*			**0.707**
None	97 (61%)		49 (61.2%)	48 (60.8%)	
Less than 1/week	23 (14.5%)		11 (13.8%)	12 (15.2%)	
1-7/week	32 (20.1%)		18 (22.5%)	14 (17.7%)	
8-14/week	5 (3.1%)		2 (2.5%)	3 (3.8%)	
15-21/week	0 (0%)		0 (0%)	0 (0%)	
More than 21/week	2 (1.3%)		0 (0%)	2 (2.5%)	

Measurement	Total	Missing	Intervention	Control	p-value
Tobacco use		*1*			**0.811**
Never	96 (60%)		47 (58.8%)	49 (61.2%)	
Former	58 (36.2%)		29 (36.2%)	29 (36.2%)	
Current smoker	6 (3.8%)		4 (5%)	2 (2.5%)	
e-cigarette	0 (0%)		0 (0%)	0 (0%)	
Other	0 (0%)		0 (0%)	0 (0%)	
Height (cm)	164.01 (9.19)	*0*	163.28 (9.18)	164.74 (9.19)	**0.317**
Weight (kg)	73.78 (17.3)	*0*	73.84 (15.86)	73.72 (18.74)	**0.967**
Body Mass Index (BMI)	27.47 (6.36)	*0*	27.76 (5.88)	27.18 (6.83)	**0.567**
Heart rate (bpm)	75.03 (10.6)	*11*	74.39 (9.93)	75.68 (11.29)	**0.462**
Systolic blood pressure (mmHg)	128.76 (13.18)	*7*	129.91 (12.51)	127.58 (13.82)	**0.275**
Diastolic blood pressure (mmHg)	75.64 (8.56)	*7*	76.28 (8.93)	74.99 (8.17)	**0.349**
Oxygen saturation (%)	95.44 (2.76)	*19*	94.71 (3.13)	96.15 (2.15)	**0.002**
Blood glucose (mg/dl)	116.59 (34.92)	*29*	118.4 (38.36)	114.72 (31.17)	**0.546**
HbA1c (%)	6.94 (0.98)	*66*	6.89 (1.04)	6.99 (0.94)	**0.615**
Creatinine (mg/dl)	1.15 (0.63)	*34*	1.17 (0.58)	1.13 (0.68)	**0.690**
Primary disease					
Primary disease CHF	67 (41.6%)	*0*	28 (34.6%)	39 (48.8%)	**0.096**
Primary disease COPD	43 (26.7%)	*0*	24 (29.6%)	19 (23.8%)	**0.506**
Primary disease DIABETES	53 (32.9%)	*0*	29 (35.8%)	24 (30%)	**0.538**
Secondary disease					
Secondary disease CHF	55 (34.2%)	*0*	31 (38.3%)	24 (30%)	**0.347**
Secondary disease COPD	39 (24.2%)	*0*	18 (22.2%)	21 (26.2%)	**0.680**
Secondary disease DIABETES	28 (17.4%)	*0*	16 (19.8%)	12 (15%)	**0.557**
Comorbidity ICD-10 codes					
Myocardial infarct	21 (13.2%)	*2*	12 (15%)	9 (11.4%)	**0.662**
Congestive heart failure	91 (57.2%)	*2*	40 (50.6%)	51 (63.8%)	**0.131**
Peripheral vascular disease	63 (39.6%)	*2*	34 (42%)	29 (37.2%)	**0.648**
Cerebrovascular disease	46 (28.8%)	*1*	24 (30%)	22 (27.5%)	**0.861**
Dementia	7 (4.3%)	*0*	4 (4.9%)	3 (3.8%)	**1.000**
Chronic pulmonary disease	73 (45.9%)	*2*	37 (46.8%)	36 (45%)	**0.942**
Rheumatic disease	21 (13.1%)	*1*	9 (11.2%)	12 (15%)	**0.640**
Peptic ulcer disease	14 (8.7%)	*0*	7 (8.6%)	7 (8.8%)	**1.000**
Mild liver disease	27 (16.9%)	*1*	13 (16.2%)	14 (17.5%)	**1.000**
Diabetes without chronic complication	42 (26.6%)	*3*	21 (26.2%)	21 (26.9%)	**1.000**
Diabetes with chronic complication	42 (26.2%)	*1*	24 (29.6%)	18 (22.8%)	**0.421**
Hemiplegia or paraplegia	15 (9.4%)	*1*	10 (12.3%)	5 (6.3%)	**0.301**
Renal disease	47 (29.7%)	*3*	27 (34.2%)	20 (25.3%)	**0.296**
Any malignancy	24 (15.1%)	*2*	9 (11.1%)	15 (19.2%)	**0.227**
Moderate or severe liver disease	10 (6.2%)	*1*	4 (4.9%)	6 (7.6%)	**0.532**
Metastatic solid tumour	0 (0%)	*1*	0 (0%)	0 (0%)	**1.000**
Barthel index, median (IQR)	70 (50,90)	*5*	70 (45,90)	70 (55,90)	**0.462**
GDS - Geriatric Depression Scale (Short Form)	6.04 (3.77)	*0*	6.49 (3.85)	5.59 (3.66)	**0.127**

Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.

3.4.4.2 Analysis of demographic and clinical indicators, by group and gender

The main differences between females and males concern marital status and the longest held occupation, as set out in Table 11. In both groups the majority of females (71,2% in the intervention and 71,4% in the control group) are widowed while the majority of males (69% in the intervention and 76,7% in the control group) are currently married. A large percentage of females (42.3% in the intervention and 30% in the control group) declared that their longest held occupation was homemaker; for men the percentage is 0% for both groups. The females of both groups reached higher values in the Barthel and

GDS questionnaires than males. Therefore, the comparison between males and females highlights that males are more capable of performing daily activities and present a lower status of depression.

Table 11: Veneto: Baseline characteristics by group and by gender

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Sample size (n)	*52*	*29*		*50*	*30*	
Age	84.92 (7.34)	82.93 (8.05)	**0.276**	84.1 (7.14)	82.53 (6.34)	**0.312**
Marital status			**<0.001**			**<0.001**
Never married	3 (5.8%)	1 (3.4%)		5 (10.2%)	1 (3.3%)	
Currently married	12 (23.1%)	20 (69%)		9 (18.4%)	23 (76.7%)	
Separated	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Divorced	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Widowed	37 (71.2%)	8 (27.6%)		35 (71.4%)	6 (20%)	
Cohabitating	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Education			**0.011**			**1.000**
Less than primary school	15 (28.8%)	1 (3.6%)		8 (16.3%)	4 (13.3%)	
Primary school	33 (63.5%)	21 (75%)		33 (67.3%)	20 (66.7%)	
Secondary school	3 (5.8%)	5 (17.9%)		7 (14.3%)	5 (16.7%)	
High school	1 (1.9%)	1 (3.6%)		1 (2%)	1 (3.3%)	
College/University	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Post graduate degree	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Longest held occupation			**<0.001**			**0.001**
Manual	28 (53.8%)	28 (96.6%)		29 (58%)	23 (76.7%)	
Non manual	2 (3.8%)	1 (3.4%)		5 (10%)	7 (23.3%)	
Unemployed (but able to work)	0 (0%)	0 (0%)		1 (2%)	0 (0%)	
Unemployed (unable to work)	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Homemaker	22 (42.3%)	0 (0%)		15 (30%)	0 (0%)	
Household income (euro/year) 0-6.999 7.000-13.999 14.000-19.999 20.000 or more	-	-	**-**	-	-	**-**
Housing tenure			**0.704**			**1.000**
Owners	43 (89.6%)	27 (93.1%)		39 (90.7%)	27 (90%)	
Renters	5 (10.4%)	2 (6.9%)		4 (9.3%)	3 (10%)	
People older than 18 living in household, median (IQR)	1 (0,1)	1 (1,2)	**0.101**	1 (0,2)	1 (1,1)	**0.143**
Mobile use (Yes)	15 (28.8%)	10 (34.5%)	**0.783**	21 (42.9%)	12 (40%)	**0.988**
PC use (Yes)	1 (1.9%)	1 (3.4%)	**1.000**	2 (4%)	0 (0%)	**0.525**
Alcohol			**0.041**			**0.005**
None	37 (71.2%)	12 (42.9%)		36 (73.5%)	12 (40%)	
Less than 1/week	4 (7.7%)	7 (25%)		7 (14.3%)	5 (16.7%)	
1-7/week	10 (19.2%)	8 (28.6%)		6 (12.2%)	8 (26.7%)	
8-14/week	1 (1.9%)	1 (3.6%)		0 (0%)	3 (10%)	
15-21/week	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
More than 21/week	0 (0%)	0 (0%)		0 (0%)	2 (6.7%)	
Tobacco use			**0.002**			**0.001**
Never	37 (71.2%)	10 (35.7%)		38 (76%)	11 (36.7%)	
Former	12 (23.1%)	17 (60.7%)		11 (22%)	18 (60%)	
Current smoker	3 (5.8%)	1 (3.6%)		1 (2%)	1 (3.3%)	
e-cigarette	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Other	0 (0%)	0 (0%)		0 (0%)	0 (0%)	

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Height (cm)	159.37 (8.68)	170.31 (4.87)	**<0.001**	160.24 (7.72)	172.23 (6.05)	**<0.001**
Weight (kg)	70.08 (15.01)	80.59 (15.32)	**0.004**	68.94 (19)	81.7 (15.56)	**0.002**
Body Mass Index (BMI)	27.72 (6.16)	27.83 (5.45)	**0.935**	26.98 (7.81)	27.52 (4.88)	**0.704**
Heart rate (bpm)	75.96 (9.52)	71.38 (10.17)	**0.063**	75.7 (11.37)	75.64 (11.36)	**0.985**
Systolic blood pressure (mmHg)	129.9 (12.99)	129.93 (11.79)	**0.993**	125.6 (13.59)	130.79 (13.81)	**0.114**
Diastolic blood pressure (mmHg)	77.04 (9.33)	74.85 (8.1)	**0.286**	74.98 (7.95)	75 (8.65)	**0.991**
Oxygen saturation (%)	95.36 (2.84)	93.62 (3.34)	**0.030**	96.57 (2.03)	95.5 (2.22)	**0.044**
Blood glucose (mg/dl)	119.02 (40.36)	117.29 (35.32)	**0.856**	111.59 (27.87)	120.08 (36.13)	**0.327**
HbA1c (%)	7.06 (1.08)	6.59 (0.9)	**0.122**	6.96 (0.99)	7.04 (0.89)	**0.749**
Creatinine (mg/dl)	1 (0.3)	1.5 (0.81)	**0.010**	1.17 (0.8)	1.05 (0.41)	**0.424**
Primary disease						
Primary disease CHF	17 (32.7%)	11 (37.9%)	**0.817**	28 (56%)	11 (36.7%)	**0.149**
Primary disease COPD	12 (23.1%)	12 (41.4%)	**0.140**	9 (18%)	10 (33.3%)	**0.197**
Primary disease DIABETES	23 (44.2%)	6 (20.7%)	**0.061**	14 (28%)	10 (33.3%)	**0.801**
Secondary disease						
Secondary disease CHF	21 (40.4%)	10 (34.5%)	**0.775**	15 (30%)	9 (30%)	**1.000**
Secondary disease COPD	11 (21.2%)	7 (24.1%)	**0.975**	15 (30%)	6 (20%)	**0.470**
Secondary disease DIABETES	10 (19.2%)	6 (20.7%)	**1.000**	5 (10%)	7 (23.3%)	**0.120**
Comorbidity ICD-10 codes						
Myocardial infarct	3 (5.8%)	9 (32.1%)	**0.003**	4 (8%)	5 (17.2%)	**0.276**
Congestive heart failure	29 (58%)	11 (37.9%)	**0.137**	37 (74%)	14 (46.7%)	**0.026**
Peripheral vascular disease	19 (36.5%)	15 (51.7%)	**0.274**	18 (36.7%)	11 (37.9%)	**1.000**
Cerebrovascular disease	13 (25.5%)	11 (37.9%)	**0.361**	12 (24%)	10 (33.3%)	**0.518**
Dementia	3 (5.8%)	1 (3.4%)	**1.000**	1 (2%)	2 (6.7%)	**0.553**
Chronic pulmonary disease	20 (39.2%)	17 (60.7%)	**0.110**	19 (38%)	17 (56.7%)	**0.164**
Rheumatic disease	8 (15.7%)	1 (3.4%)	**0.145**	12 (24%)	0 (0%)	**0.003**
Peptic ulcer disease	2 (3.8%)	5 (17.2%)	**0.091**	3 (6%)	4 (13.3%)	**0.416**
Mild liver disease	8 (15.7%)	5 (17.2%)	**1.000**	6 (12%)	8 (26.7%)	**0.171**
Diabetes without chronic complication	14 (27.5%)	7 (24.1%)	**0.953**	11 (22.9%)	10 (33.3%)	**0.455**
Diabetes with chronic complication	17 (32.7%)	7 (24.1%)	**0.579**	9 (18%)	9 (31%)	**0.292**
Hemiplegia or paraplegia	5 (9.6%)	5 (17.2%)	**0.482**	1 (2%)	4 (13.8%)	**0.058**
Renal disease	17 (33.3%)	10 (35.7%)	**1.000**	16 (32.7%)	4 (13.3%)	**0.099**
Any malignancy	4 (7.7%)	5 (17.2%)	**0.270**	10 (20.8%)	5 (16.7%)	**0.874**
Moderate or severe liver disease	2 (3.8%)	2 (6.9%)	**0.615**	2 (4.1%)	4 (13.3%)	**0.194**
Metastatic solid tumor	0 (0%)	0 (0%)	**1.000**	0 (0%)	0 (0%)	**1.000**
Barthel index, median (IQR)	67.5 (35,90)	75 (55,100)	**0.102**	70 (55,83.8)	77.5 (56.2,98.8)	**0.224**
GDS - Geriatric Depression Scale (Short Form)	7.02 (3.8)	5.55 (3.81)	**0.102**	6.04 (3.71)	4.83 (3.49)	**0.149**
Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.						

3.4.4.3 Analysis of PIRU by group

The analysis of the data obtained by the PIRU questionnaires does not demonstrate statistically significant differences. Table 12 shows that the majority of patients declare that all their needs are assessed and that they (and their families or carers) are involved in their treatment, care and support. The patients of the intervention and control group have a different opinion (p=041) regarding the question "Do you feel this person understands about you and your condition?". The majority of patients (79% in the intervention and 66.2% in the control group) answered "Yes, definitely" but four patients in the control group answered "No".

Table 12: Veneto: Baseline PIRU questionnaire by group

Measurement	Total	Missing	Intervention	Control	p-value
Have all your needs been assessed?		*0*			**1**
All of my needs have been assessed	104 (64.6%)		52 (64.2%)	52 (65%)	
Some of my needs have been assessed	47 (29.2%)		24 (29.6%)	23 (28.8%)	
None of my needs have been assessed	3 (1.9%)		2 (2.5%)	1 (1.2%)	
Don't know/can't remember	7 (4.3%)		3 (3.7%)	4 (5%)	
Were you involved as much as you wanted to be in decisions about your care and support?					
		0			**0.270**
Yes, definitely	105 (65.2%)		48 (59.3%)	57 (71.2%)	
Yes, to some extent	49 (30.4%)		29 (35.8%)	20 (25%)	
No	7 (4.3%)		4 (4.9%)	3 (3.8%)	
Were you involved as much as you wanted to be in decisions about your treatment?					
		0			**0.505**
Yes, definitely	111 (68.9%)		54 (66.7%)	57 (71.2%)	
Yes, to some extent	45 (28%)		23 (28.4%)	22 (27.5%)	
No	5 (3.1%)		4 (4.9%)	1 (1.2%)	
Were your family or carer involved in decisions about your care and support as much as you wanted them to be?					
		0			**0.408**
Yes, definitely	114 (70.8%)		55 (67.9%)	59 (73.8%)	
Yes, to some extent	37 (23%)		22 (27.2%)	15 (18.8%)	
No	7 (4.3%)		2 (2.5%)	5 (6.2%)	
There were no family or carers available to be involved	3 (1.9%)		2 (2.5%)	1 (1.2%)	
I didn't want my family or carer to be involved in decisions about my care and support	0 (0%)		0 (0%)	0 (0%)	
Were your family or carer involved in decisions about your treatment as much as you wanted them to be?					
		0			**0.263**
Yes, definitely	119 (73.9%)		57 (70.4%)	62 (77.5%)	
Yes, to some extent	31 (19.3%)		20 (24.7%)	11 (13.8%)	
No	7 (4.3%)		2 (2.5%)	5 (6.2%)	
There were no family or carers available to be involved	4 (2.5%)		2 (2.5%)	2 (2.5%)	
I didn't want my family or carer to be involved in decisions about my treatment and support	0 (0%)		0 (0%)	0 (0%)	
Overall, do you feel that your carer/family has had as much support from health and social services as they needed?					
		0			**0.175**
Yes, they have had as much support as they needed	119 (73.9%)		58 (71.6%)	61 (76.2%)	
They have had some support but not as much as they needed	30 (18.6%)		18 (22.2%)	12 (15%)	
No, they have had little or no support	4 (2.5%)		3 (3.7%)	1 (1.2%)	
They did not want/need support	4 (2.5%)		0 (0%)	4 (5%)	

Measurement	Total	Missing	Intervention	Control	p-value
There are no family members or carers to support	4 (2.5%)		2 (2.5%)	2 (2.5%)	
To what extent do you agree or disagree with the following statement...'Health and social care staff always tell me what will happen next'					
		0			**0.740**
Strongly agree	52 (32.3%)		28 (34.6%)	24 (30%)	
Agree	66 (41%)		34 (42%)	32 (40%)	
Neither agree nor disagree	37 (23%)		17 (21%)	20 (25%)	
Disagree	6 (3.7%)		2 (2.5%)	4 (5%)	
Strongly disagree					
When health or social care staff plan care or treatment for you, does it happen?					
		0			**0.181**
Yes, it happens all of the time	93 (57.8%)		51 (63%)	42 (52.5%)	
It happens most of the time	56 (34.8%)		27 (33.3%)	29 (36.2%)	
It happens some of the time	9 (5.6%)		3 (3.7%)	6 (7.5%)	
No	3 (1.9%)		0 (0%)	3 (3.8%)	
To what extent do you agree or disagree with the following statement...'My care and support is reviewed as often as it should be'					
		0			**0.103**
Strongly agree	57 (35.4%)		33 (40.7%)	24 (30%)	
Agree	83 (51.6%)		42 (51.9%)	41 (51.2%)	
Neither agree nor disagree	20 (12.4%)		6 (7.4%)	14 (17.5%)	
Disagree	1 (0.6%)		0 (0%)	1 (1.2%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
To what extent do you agree or disagree with the following statement...'My treatment is reviewed as often as it should be'					
		0			**0.413**
Strongly agree	61 (37.9%)		33 (40.7%)	28 (35%)	
Agree	80 (49.7%)		41 (50.6%)	39 (48.8%)	
Neither agree nor disagree	19 (11.8%)		7 (8.6%)	12 (15%)	
Disagree	1 (0.6%)		0 (0%)	1 (1.2%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
To what extent do you agree or disagree with the following statement...'My medicines are thoroughly reviewed as often as they should be'					
		0			**0.758**
Strongly agree	67 (41.6%)		36 (44.4%)	31 (38.8%)	
Agree	81 (50.3%)		39 (48.1%)	42 (52.5%)	
Neither agree nor disagree	13 (8.1%)		6 (7.4%)	7 (8.8%)	
Disagree	0 (0%)		0 (0%)	0 (0%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
Do you have a named health or social care professional who co-ordinates your care and support?					
		0			**0.406**
Yes	62 (38.5%)		35 (43.2%)	27 (33.8%)	
No, I co-ordinate my own care and support	64 (39.8%)		31 (38.3%)	33 (41.2%)	
Don't know/not sure	35 (21.7%)		15 (18.5%)	20 (25%)	

Measurement	Total	Missing	Intervention	Control	p-value
If you have questions, when can you contact the people treating and caring for you? Please tick ALL the apply					
		0			**0.619**
During normal working hours	151 (93.8%)		77 (95.1%)	74 (92.5%)	
During the evening	1 (0.6%)		0 (0%)	1 (1.2%)	
During the night	0 (0%)		0 (0%)	0 (0%)	
Weekends	0 (0%)		0 (0%)	0 (0%)	
Don't know/not sure	9 (5.6%)		4 (4.9%)	5 (6.2%)	
Do you feel this person understands about you and your condition?					
		0			**0.041**
Yes, definitely	117 (72.7%)		64 (79%)	53 (66.2%)	
Yes, to some extent	40 (24.8%)		17 (21%)	23 (28.8%)	
No	4 (2.5%)		0 (0%)	4 (5%)	
Do all the different people treating and caring for you work well together to give you the best possible care and support?					
		0			**0.460**
Yes, all of them work well together	107 (66.5%)		57 (70.4%)	50 (62.5%)	
Most of them work well together	47 (29.2%)		20 (24.7%)	27 (33.8%)	
Some of them work well together	4 (2.5%)		3 (3.7%)	1 (1.2%)	
No, they do not work well together	0 (0%)		0 (0%)	0 (0%)	
Don't know/not sure	3 (1.9%)		1 (1.2%)	2 (2.5%)	
Do health and social care services help you live the life you want as far as possible?					
		0			**0.783**
Yes, definitely	91 (56.5%)		46 (56.8%)	45 (56.2%)	
Yes, to some extent	64 (39.8%)		33 (40.7%)	31 (38.8%)	
No	6 (3.7%)		2 (2.5%)	4 (5%)	
To what extent do you agree or disagree with the following statement…'In the last 12 months, health and social care staff have given me information about other services that are available to someone in my circumstances, including support organisations'					
		0			**0.750**
Strongly agree	24 (14.9%)		15 (18.5%)	9 (11.2%)	
Agree	60 (37.3%)		28 (34.6%)	32 (40%)	
Neither agree nor disagree	54 (33.5%)		26 (32.1%)	28 (35%)	
Disagree	19 (11.8%)		10 (12.3%)	9 (11.2%)	
Strongly disagree	4 (2.5%)		2 (2.5%)	2 (2.5%)	

3.4.5 Puglia

3.4.5.1 Analysis of demographic and clinical indicators, by group

In baseline characteristics by group, no significant differences were found in age, sex and marital status between the two groups (intervention and controls). Regarding the educational level: the mean differences were in primary school (55.1% vs 37%) and in secondary and high school (9.2% and 7.1% vs 18% and 14%).

95.9% of intervention and 93.3% of control group are the owner of their house with no statistically significant differences. There are no subjects aged 18 or below who lived with either intervention or controls. 76% of intervention and 70% of controls were used to using mobile phone, while only 8.3% of intervention and 17% of controls reported use of PC.

The difference in alcohol consumption between the two groups is not clinically relevant, while tobacco use is not different in the two cohorts.

The average values of height, weight, heart rate, blood pressure (systolic and diastolic), oxygen saturation, glycated hemoglobin were significantly different, but an analysis with a categorisation of these variables is needed.

The analysis of primary, secondary pathology and comorbidities reveals the absence of homogeneity between cases and controls.

The Barthel Index, the score that measures the quality of life analysing aspects such as, for example, self-sufficiency and motor skills, testified a median value equal to 95 in intervention group compared with a higher index and more homogeneity in controls, equal to 100, with a very significant p-value. GDS, the indicator that measures the severity of depressive symptoms, showed results on average higher in the intervention group, 5.56 vs. 3.46, but without clinical significance. The clinical relevance needed a better qualification according to introduction of well-defined cut-offs.

Table 13: Puglia: Baseline characteristics by group

Measurement	Total	Missing	Intervention	Control	p-value
Sample size (n)	*200*		*100*	*100*	
Age	74.72 (6.73)	*0*	75.49 (6.51)	73.96 (6.88)	**0.108**
Gender		*0*			**1.000**
Female	91 (45.5%)		45 (45%)	46 (46%)	
Male	109 (54.5%)		55 (55%)	54 (54%)	
Marital status		*0*			**0.885**
Never married	5 (2.5%)		2 (2%)	3 (3%)	
Currently married	150 (75%)		77 (77%)	73 (73%)	
Separated	1 (0.5%)		0 (0%)	1 (1%)	
Divorced	3 (1.5%)		1 (1%)	2 (2%)	
Widowed	41 (20.5%)		20 (20%)	21 (21%)	
Cohabitating	0 (0%)		0 (0%)	0 (0%)	
Education		*2*			**0.063**
Less than primary school	53 (26.8%)		26 (26.5%)	27 (27%)	
Primary school	91 (46%)		54 (55.1%)	37 (37%)	
Secondary school	27 (13.6%)		9 (9.2%)	18 (18%)	
High school	21 (10.6%)		7 (7.1%)	14 (14%)	
College/University	5 (2.5%)		2 (2%)	3 (3%)	
Post graduate degree	1 (0.5%)		0 (0%)	1 (1%)	
Longest held occupation		*169*			**0.343**
Manual	9 (29%)		0 (0%)	9 (33.3%)	
Non manual	8 (25.8%)		1 (25%)	7 (25.9%)	
Unemployed (but able to work)	0 (0%)		0 (0%)	0 (0%)	
Unemployed (unable to work)	0 (0%)		0 (0%)	0 (0%)	
Homemaker	14 (45.2%)		3 (75%)	11 (40.7%)	
Household income (euro/year)					
0-6.999					
7.000-13.999	-	-	-	-	-
14.000-19.999					
20.000 or more					
Housing tenure		*6*			**0.535**
Owners	184 (94.8%)		94 (95.9%)	90 (93.8%)	
Renters	10 (5.2%)		4 (4.1%)	6 (6.2%)	
People older than 18 living in household, median (IQR)	2 (1,2)	*98*	2 (1,2)	1 (1,1.8)	**0.090**
Mobile use (Yes)	146 (73%)	*0*	76 (76%)	70 (70%)	**0.426**
PC use (Yes)	25 (12.8%)	*4*	8 (8.3%)	17 (17%)	**0.109**

Measurement	Total	Missing	Intervention	Control	p-value
Alcohol		*25*			**<0.001**
None	39 (22.3%)		0 (0%)	39 (39.8%)	
Less than 1/week	32 (18.3%)		26 (33.8%)	6 (6.1%)	
1-7/week	14 (8%)		5 (6.5%)	9 (9.2%)	
8-14/week	6 (3.4%)		6 (7.8%)	0 (0%)	
15-21/week	2 (1.1%)		0 (0%)	2 (2%)	
More than 21/week	82 (46.9%)		40 (51.9%)	42 (42.9%)	
Tobacco use		*4*			**0.810**
Never	113 (57.7%)		54 (55.7%)	59 (59.6%)	
Former	76 (38.8%)		39 (40.2%)	37 (37.4%)	
Current smoker	7 (3.6%)		4 (4.1%)	3 (3%)	
e-cigarette	0 (0%)		0 (0%)	0 (0%)	
Other	0 (0%)		0 (0%)	0 (0%)	
Height (cm)	159.94 (9.25)	*0*	161.98 (8.32)	157.91 (9.72)	**0.002**
Weight (kg)	77.61 (15.13)	*0*	80.2 (16.95)	75.01 (12.61)	**0.015**
Body Mass Index (BMI)	30.41 (5.83)	*0*	30.65 (6.58)	30.16 (5)	**0.547**
Heart rate (bpm)	73.68 (12.77)	*1*	70.48 (12.4)	76.84 (12.39)	**<0.001**
Systolic blood pressure (mmHg)	131.71 (21.13)	*0*	128.16 (22.16)	135.25 (19.52)	**0.017**
Diastolic blood pressure (mmHg)	73.33 (11.62)	*0*	69.56 (12.71)	77.11 (8.99)	**<0.001**
Oxygen saturation (%)	96.35 (2.46)	*4*	95.75 (2.75)	96.92 (2)	**0.001**
Blood glucose (mg/dl)	137.94 (43.58)	*2*	142.9 (48.21)	132.98 (37.99)	**0.110**
HbA1c (%)	6.95 (0.96)	*58*	7.27 (0.96)	6.72 (0.9)	**0.001**
Creatinine (mg/dl)	1 (0.34)	*14*	1.03 (0.35)	0.97 (0.33)	**0.232**
Primary disease					
Primary disease CHF	31 (15.5%)	*0*	28 (28%)	3 (3%)	**<0.001**
Primary disease COPD	46 (23%)	*0*	35 (35%)	11 (11%)	**<0.001**
Primary disease DIABETES	140 (70%)	*0*	57 (57%)	83 (83%)	**<0.001**
Secondary disease					
Secondary disease CHF	28 (14%)	*0*	24 (24%)	4 (4%)	**<0.001**
Secondary disease COPD	44 (22%)	*0*	30 (30%)	14 (14%)	**0.010**
Secondary disease DIABETES	135 (67.5%)	*0*	58 (58%)	77 (77%)	**0.007**
Comorbidity ICD-10 codes					
Myocardial infarct	41 (20.9%)	*4*	29 (29%)	12 (12.5%)	**0.008**
Congestive heart failure	42 (21.4%)	*4*	37 (37.4%)	5 (5.2%)	**<0.001**
Peripheral vascular disease	58 (29.6%)	*4*	51 (52%)	7 (7.1%)	**<0.001**
Cerebrovascular disease	31 (15.6%)	*1*	22 (22%)	9 (9.1%)	**0.021**
Dementia	7 (3.6%)	*6*	5 (5.1%)	2 (2.1%)	**0.445**
Chronic pulmonary disease	62 (31.2%)	*1*	47 (47%)	15 (15.2%)	**<0.001**
Rheumatic disease	7 (3.5%)	*1*	6 (6%)	1 (1%)	**0.118**
Peptic ulcer disease	6 (3%)	*1*	6 (6%)	0 (0%)	**0.029**
Mild liver disease	10 (5%)	*1*	10 (10%)	0 (0%)	**0.002**
Diabetes without chronic complication	55 (27.8%)	*2*	54 (54%)	1 (1%)	**<0.001**
Diabetes with chronic complication	69 (35.6%)	*6*	29 (29%)	40 (42.6%)	**0.069**
Hemiplegia or paraplegia	3 (1.5%)	*2*	2 (2%)	1 (1%)	**1.000**
Renal disease	9 (4.5%)	*2*	9 (9%)	0 (0%)	**0.003**
Any malignancy	17 (8.5%)	*1*	17 (17%)	0 (0%)	**<0.001**
Moderate or severe liver disease	9 (4.5%)	*2*	5 (5%)	4 (4.1%)	**1.000**
Metastatic solid tumor	0 (0%)	*1*	0 (0%)	0 (0%)	**1.000**
Barthel index, median (IQR)	100 (90,100)	*10*	95 (75,100)	100 (100,100)	**<0.001**
GDS - Geriatric Depression Scale (Short Form)	4.55 (3.43)	*0*	5.64 (3.55)	3.46 (2.94)	**<0.001**

Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.

3.4.5.2 Analysis of demographic and clinical indicators, by group and gender

In Table 14, baseline characteristics by group and by gender, preliminary results of the analysis are similar to those of the previous table.

Table 14: Puglia: Baseline characteristics by group and by gender

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Sample size (n)	*45*	*55*		*46*	*54*	
Age	76.96 (7.38)	74.29 (5.48)	**0.048**	73.83 (6.78)	74.07 (7.03)	**0.858**
Marital status			**<0.001**			**<0.001**
Never married	1 (2.2%)	1 (1.8%)		0 (0%)	3 (5.6%)	
Currently married	26 (57.8%)	51 (92.7%)		28 (60.9%)	45 (83.3%)	
Separated	0 (0%)	0 (0%)		0 (0%)	1 (1.9%)	
Divorced	0 (0%)	1 (1.8%)		1 (2.2%)	1 (1.9%)	
Widowed	18 (40%)	2 (3.6%)		17 (37%)	4 (7.4%)	
Cohabitating	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Education			**0.020**			**0.001**
Less than primary school	18 (41.9%)	8 (14.5%)		17 (37%)	10 (18.5%)	
Primary school	20 (46.5%)	34 (61.8%)		23 (50%)	14 (25.9%)	
Secondary school	3 (7%)	6 (10.9%)		3 (6.5%)	15 (27.8%)	
High school	1 (2.3%)	6 (10.9%)		3 (6.5%)	11 (20.4%)	
College/University	1 (2.3%)	1 (1.8%)		0 (0%)	3 (5.6%)	
Post graduate degree	0 (0%)	0 (0%)		0 (0%)	1 (1.9%)	
Longest held occupation			**0.250**			**<0.001**
Manual	0 (0%)	0 (0%)		4 (25%)	5 (45.5%)	
Non manual	0 (0%)	1 (100%)		1 (6.2%)	6 (54.5%)	
Unemployed (but able to work)	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Unemployed (unable to work)	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Homemaker	3 (100%)	0 (0%)		11 (68.8%)	0 (0%)	
Household income (euro/year) 0-6.999 7.000-13.999 14.000-19.999 20.000 or more	-	-	-	-	-	-
Housing tenure			**0.323**			**1.000**
Owners	41 (93.2%)	53 (98.1%)		40 (93%)	50 (94.3%)	
Renters	3 (6.8%)	1 (1.9%)		3 (7%)	3 (5.7%)	
People older than 18 living in household, median (IQR)	2 (1,2)	2 (1,2)	**0.255**	1 (1,1)	1 (1,2)	**0.557**
Mobile use (Yes)	32 (71.1%)	44 (80%)	**0.424**	25 (54.3%)	45 (83.3%)	**0.003**
PC use (Yes)	1 (2.3%)	7 (13.2%)	**0.071**	1 (2.2%)	16 (29.6%)	**0.001**
Alcohol			**0.101**			**<0.001**
None	0 (0%)	0 (0%)		29 (63%)	10 (19.2%)	
Less than 1/week	14 (50%)	12 (24.5%)		3 (6.5%)	3 (5.8%)	
1-7/week	2 (7.1%)	3 (6.1%)		5 (10.9%)	4 (7.7%)	
8-14/week	2 (7.1%)	4 (8.2%)		0 (0%)	0 (0%)	
15-21/week	0 (0%)	0 (0%)		0 (0%)	2 (3.8%)	
More than 21/week	10 (35.7%)	30 (61.2%)		9 (19.6%)	33 (63.5%)	
Tobacco use			**<0.001**			**<0.001**
Never	37 (86%)	17 (31.5%)		45 (97.8%)	14 (26.4%)	
Former	5 (11.6%)	34 (63%)		1 (2.2%)	36 (67.9%)	
Current smoker	1 (2.3%)	3 (5.6%)		0 (0%)	3 (5.7%)	

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
e-cigarette	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Other	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Height (cm)	157.73 (8.3)	165.45 (6.59)	**<0.001**	150.52 (6.89)	164.2 (6.95)	**<0.001**
Weight (kg)	77.73 (17.92)	82.22 (16)	**0.195**	71.7 (13)	77.83 (11.66)	**0.016**
Body Mass Index (BMI)	31.49 (7.94)	29.97 (5.19)	**0.274**	31.62 (5.31)	28.91 (4.39)	**0.007**
Heart rate (bpm)	73.76 (13.11)	67.76 (11.19)	**0.018**	75.22 (12.57)	78.22 (12.18)	**0.230**
Systolic blood pressure (mmHg)	124.6 (22.06)	131.07 (22.02)	**0.147**	136.3 (18.72)	134.35 (20.31)	**0.618**
Diastolic blood pressure (mmHg)	71.2 (13.86)	68.22 (11.66)	**0.254**	77.33 (9.65)	76.93 (8.48)	**0.828**
Oxygen saturation (%)	96.16 (2.78)	95.4 (2.7)	**0.182**	97.07 (1.78)	96.8 (2.18)	**0.498**
Blood glucose (mg/dl)	139.36 (47.1)	145.73 (49.34)	**0.515**	134.84 (34.81)	131.43 (40.7)	**0.653**
HbA1c (%)	7.09 (0.81)	7.41 (1.06)	**0.201**	6.78 (0.76)	6.66 (1.02)	**0.547**
Creatinine (mg/dl)	0.95 (0.21)	1.09 (0.41)	**0.039**	0.88 (0.34)	1.06 (0.3)	**0.006**
Primary disease						
Primary disease CHF	15 (33.3%)	13 (23.6%)	**0.395**	1 (2.2%)	2 (3.7%)	**1.000**
Primary disease COPD	13 (28.9%)	22 (40%)	**0.343**	3 (6.5%)	8 (14.8%)	**0.317**
Primary disease DIABETES	26 (57.8%)	31 (56.4%)	**1.000**	41 (89.1%)	42 (77.8%)	**0.215**
Secondary disease						
Secondary disease CHF	11 (24.4%)	13 (23.6%)	**1.000**	2 (4.3%)	2 (3.7%)	**1.000**
Secondary disease COPD	10 (22.2%)	20 (36.4%)	**0.188**	3 (6.5%)	11 (20.4%)	**0.089**
Secondary disease DIABETES	27 (60%)	31 (56.4%)	**0.871**	39 (84.8%)	38 (70.4%)	**0.142**
Comorbidity ICD-10 codes						
Myocardial infarct	11 (24.4%)	18 (32.7%)	**0.492**	6 (13.6%)	6 (11.5%)	**1.000**
Congestive heart failure	22 (48.9%)	15 (27.8%)	**0.051**	1 (2.3%)	4 (7.5%)	**0.373**
Peripheral vascular disease	23 (52.3%)	28 (51.9%)	**1.000**	1 (2.3%)	6 (11.1%)	**0.125**
Cerebrovascular disease	10 (22.2%)	12 (21.8%)	**1.000**	4 (8.9%)	5 (9.3%)	**1.000**
Dementia	2 (4.5%)	3 (5.6%)	**1.000**	0 (0%)	2 (3.8%)	**0.500**
Chronic pulmonary disease	26 (57.8%)	21 (38.2%)	**0.080**	4 (8.9%)	11 (20.4%)	**0.192**
Rheumatic disease	3 (6.7%)	3 (5.5%)	**1.000**	1 (2.2%)	0 (0%)	**0.455**
Peptic ulcer disease	2 (4.4%)	4 (7.3%)	**0.688**	0 (0%)	0 (0%)	**1.000**
Mild liver disease	1 (2.2%)	9 (16.4%)	**0.021**	0 (0%)	0 (0%)	**1.000**
Diabetes without chronic complication	25 (55.6%)	29 (52.7%)	**0.936**	0 (0%)	1 (1.9%)	**1.000**
Diabetes with chronic complication	16 (35.6%)	13 (23.6%)	**0.278**	19 (44.2%)	21 (41.2%)	**0.933**
Hemiplegia or paraplegia	1 (2.2%)	1 (1.8%)	**1.000**	0 (0%)	1 (1.9%)	**1.000**
Renal disease	6 (13.3%)	3 (5.5%)	**0.292**	0 (0%)	0 (0%)	**1.000**
Any malignancy	4 (8.9%)	13 (23.6%)	**0.092**	0 (0%)	0 (0%)	**1.000**
Moderate or severe liver disease	1 (2.2%)	4 (7.3%)	**0.375**	1 (2.2%)	3 (5.7%)	**0.622**
Metastatic solid tumor	0 (0%)	0 (0%)	**1.000**	0 (0%)	0 (0%)	**1.000**
Barthel index, median (IQR)	92.5 (65,100)	100 (83.8,100)	**0.043**	100 (100,100)	100 (100,100)	**0.154**
GDS - Geriatric Depression Scale (Short Form)	6.87 (3.71)	4.64 (3.11)	**0.002**	4.5 (3.15)	2.57 (2.44)	**0.001**

Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.

3.4.5.3 Analysis of PIRU by group

With regard to integrated care (PIRU questionnaire) a comparison between the two groups shows a significant difference in all items explored, with answers very homogeneous and strongly positive in the control group compared to the intervention group.

This finding may indicate a bias related to: a) a very subjective interpretation of questions; b) the possible influence of the interviewers who were different between intervention and controls; c) the possible effect due to the devices' introduction in the pilot site (changes in habits, devices malfunctioning, etc.) which diverted care manager's energies from the integrated care to the management of the new technologies.

Table 15: Puglia: Baseline PIRU questionnaire by group

Measurement	Total	Missing	Intervention	Control	p-value
Have all your needs been assessed?		*0*			**<0.001**
All of my needs have been assessed	126 (63%)		31 (31%)	95 (95%)	
Some of my needs have been assessed	72 (36%)		67 (67%)	5 (5%)	
None of my needs have been assessed	0 (0%)		0 (0%)	0 (0%)	
Don't know/can't remember	2 (1%)		2 (2%)	0 (0%)	
Were you involved as much as you wanted to be in decisions about your care and support?					
		0			**<0.001**
Yes, definitely	127 (63.5%)		33 (33%)	94 (94%)	
Yes, to some extent	71 (35.5%)		65 (65%)	6 (6%)	
No	2 (1%)		2 (2%)	0 (0%)	
Were you involved as much as you wanted to be in decisions about your treatment?					
		0			**<0.001**
Yes, definitely	133 (66.5%)		38 (38%)	95 (95%)	
Yes, to some extent	65 (32.5%)		60 (60%)	5 (5%)	
No	2 (1%)		2 (2%)	0 (0%)	
Were your family or carer involved in decisions about your care and support as much as you wanted them to be?					
		0			**<0.001**
Yes, definitely	139 (69.5%)		43 (43%)	96 (96%)	
Yes, to some extent	56 (28%)		54 (54%)	2 (2%)	
No	3 (1.5%)		3 (3%)	0 (0%)	
There were no family or carers available to be involved	2 (1%)		0 (0%)	2 (2%)	
I didn't want my family or carer to be involved in decisions about my care and support	0 (0%)		0 (0%)	0 (0%)	
Were your family or carer involved in decisions about your treatment as much as you wanted them to be?					
		0			**<0.001**
Yes, definitely	139 (69.5%)		43 (43%)	96 (96%)	
Yes, to some extent	56 (28%)		54 (54%)	2 (2%)	
No	2 (1%)		2 (2%)	0 (0%)	
There were no family or carers available to be involved	3 (1.5%)		1 (1%)	2 (2%)	
I didn't want my family or carer to be involved in decisions about my treatment and support	0 (0%)		0 (0%)	0 (0%)	
Overall, do you feel that your carer/family has had as much support from health and social services as they needed?					
		0			**<0.001**
Yes, they have had as much support as they needed	109 (54.5%)		15 (15%)	94 (94%)	

Measurement	Total	Missing	Intervention	Control	p-value
They have had some support but not as much as they needed	73 (36.5%)		69 (69%)	4 (4%)	
No, they have had little or no support	10 (5%)		10 (10%)	0 (0%)	
They did not want/need support	5 (2.5%)		5 (5%)	0 (0%)	
There are no family members or carers to support	3 (1.5%)		1 (1%)	2 (2%)	
To what extent do you agree or disagree with the following statement...'Health and social care staff always tell me what will happen next'					
		0			**<0.001**
Strongly agree	95 (47.5%)		4 (4%)	91 (91%)	
Agree	74 (37%)		66 (66%)	8 (8%)	
Neither agree nor disagree	29 (14.5%)		28 (28%)	1 (1%)	
Disagree	2 (1%)		2 (2%)	0 (0%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
When health or social care staff plan care or treatment for you, does it happen?					
		0			**<0.001**
Yes, it happens all of the time	108 (54%)		15 (15%)	93 (93%)	
It happens most of the time	76 (38%)		70 (70%)	6 (6%)	
It happens some of the time	16 (8%)		15 (15%)	1 (1%)	
No	0 (0%)		0 (0%)	0 (0%)	
To what extent do you agree or disagree with the following statement...'My care and support is reviewed as often as it should be'					
		0			**<0.001**
Strongly agree	103 (51.5%)		9 (9%)	94 (94%)	
Agree	91 (45.5%)		86 (86%)	5 (5%)	
Neither agree nor disagree	6 (3%)		5 (5%)	1 (1%)	
Disagree	0 (0%)		0 (0%)	0 (0%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
To what extent do you agree or disagree with the following statement...'My treatment is reviewed as often as it should be'					
		0			**<0.001**
Strongly agree	98 (49%)		6 (6%)	92 (92%)	
Agree	97 (48.5%)		90 (90%)	7 (7%)	
Neither agree nor disagree	5 (2.5%)		4 (4%)	1 (1%)	
Disagree	0 (0%)		0 (0%)	0 (0%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	
To what extent do you agree or disagree with the following statement...'My medicines are thoroughly reviewed as often as they should be'					
		0			**<0.001**
Strongly agree	106 (53%)		16 (16%)	90 (90%)	
Agree	92 (46%)		82 (82%)	10 (10%)	
Neither agree nor disagree	1 (0.5%)		1 (1%)	0 (0%)	
Disagree	1 (0.5%)		1 (1%)	0 (0%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	

Measurement	Total	Missing	Intervention	Control	p-value
Do you have a named health or social care professional who co-ordinates your care and support?					
		0			**<0.001**
Yes	157 (78.5%)		57 (57%)	100 (100%)	
No, I co-ordinate my own care and support	34 (17%)		34 (34%)	0 (0%)	
Don't know/not sure	9 (4.5%)		9 (9%)	0 (0%)	
If you have questions, when can you contact the people treating and caring for you? Please tick ALL the apply					
		0			**0.014**
During normal working hours	193 (96.5%)		93 (93%)	100 (100%)	
During the evening	0 (0%)		0 (0%)	0 (0%)	
During the night	0 (0%)		0 (0%)	0 (0%)	
Weekends	0 (0%)		0 (0%)	0 (0%)	
Don't know/not sure	7 (3.5%)		7 (7%)	0 (0%)	
Do you feel this person understands about you and your condition?					
		0			**<0.001**
Yes, definitely	130 (65%)		31 (31%)	99 (99%)	
Yes, to some extent	70 (35%)		69 (69%)	1 (1%)	
No	0 (0%)		0 (0%)	0 (0%)	
Do all the different people treating and caring for you work well together to give you the best possible care and support?					
		0			**<0.001**
Yes, all of them work well together	87 (43.5%)		7 (7%)	80 (80%)	
Most of them work well together	88 (44%)		69 (69%)	19 (19%)	
Some of them work well together	23 (11.5%)		23 (23%)	0 (0%)	
No, they do not work well together	1 (0.5%)		0 (0%)	1 (1%)	
Don't know/not sure	1 (0.5%)		1 (1%)	0 (0%)	
Do health and social care services help you live the life you want as far as possible?					
		0			**<0.001**
Yes, definitely	87 (43.5%)		4 (4%)	83 (83%)	
Yes, to some extent	106 (53%)		90 (90%)	16 (16%)	
No	7 (3.5%)		6 (6%)	1 (1%)	
To what extent do you agree or disagree with the following statement…'In the last 12 months, health and social care staff have given me information about other services that are available to someone in my circumstances, including support organisations'					
		0			**<0.001**
Strongly agree	84 (42%)		3 (3%)	81 (81%)	
Agree	93 (46.5%)		76 (76%)	17 (17%)	
Neither agree nor disagree	17 (8.5%)		15 (15%)	2 (2%)	
Disagree	6 (3%)		6 (6%)	0 (0%)	
Strongly disagree	0 (0%)		0 (0%)	0 (0%)	

3.4.6 Powys

The baseline analysis from Powys is not available for this document. Although 103 patients have been recruited, delays in the recruitment of the full cohort of patients, and

several problems with data processing and uploading to the central database, have had a direct impact on the baseline analysis. The results of the baseline analysis and the corresponding interpretation of findings will be included in future documents.

3.4.7 Global overview

At this time, a total of 766 patients have been recruited across all the sites; 384 patients have been assigned to the intervention group and 382 to the control group. These figures will increase, considering the difficulties with data uploading experienced by some sites.

3.4.7.1 Analysis of demographic and clinical indicators, by group

Participants have a mean age of 78.2 years, with no differences between groups. Regarding gender distribution, 52.6% are men, again without differences between groups. However, the education level of participants shows higher levels of education in the patients in the intervention group. Nevertheless these differences are not significant from a statistical point of view. These observed differences can be found in similar studies when taking part in an innovative care experience is demanded of patients and their families.

More surprising is the absence of differences in mobile and PC use between groups, and the high percentage of subjects familiar with these devices.

Regarding health related living habits, most of the participants present a moderate pattern of alcohol consumption, though 21% of the intervention group and 16% of controls declare they have a high level of weekly alcohol intake. Most participants are smokers or former smokers, without differences between groups.

When clinical control parameters are assessed, mean blood pressure reaches values of hypertension, and the mean value of BMI corresponds to obesity. These clinical variables present statistically significant differences between intervention and control group, but do not have clinical meaning. The high number of missing values for HbA1c and creatinine levels reflects their clinical relevance to specific diseases, for example, HbA1c would only be assessed for diabetic patients; it has no clinical meaning for patients with other diseases

As expected, the most frequent disease among participants is diabetes mellitus, considered the primary disease for 38% of subjects in the intervention group and 42% for the control, without differences between groups.

Another remarkable characteristic of participants is their level of functional dependence, measured by Barthel Index. In this case there is a considerable difference between intervention and control group, with subjects in the intervention group having a mean of 95, and 100 for the controls, being classified both as autonomous.

Regarding baseline mental health, both groups present mean values corresponding to normality, though close to depression.

Table 16: Summary: Baseline characteristics by group

Measurement	Total	Missing	Intervention	Control	p-value
Sample size (n)	*766*		*384*	*382*	
Age	78.23 (7.7)	*6*	78.38 (7.75)	78.08 (7.66)	**0.592**
Gender		*5*			**0.585**
Female	361 (47.4%)		185 (48.6%)	176 (46.3%)	
Male	400 (52.6%)		196 (51.4%)	204 (53.7%)	
Marital status		*106*			**0.707**
Never married	29 (4.4%)		15 (4.5%)	14 (4.3%)	
Currently married	398 (60.3%)		209 (63.1%)	189 (57.4%)	
Separated	4 (0.6%)		2 (0.6%)	2 (0.6%)	

Measurement	Total	Missing	Intervention	Control	p-value
Divorced	7 (1.1%)		3 (0.9%)	4 (1.2%)	
Widowed	219 (33.2%)		101 (30.5%)	118 (35.9%)	
Cohabitating	3 (0.5%)		1 (0.3%)	2 (0.6%)	
Education		*10*			**0.699**
Less than primary school	129 (17.1%)		63 (16.7%)	66 (17.4%)	
Primary school	358 (47.4%)		185 (49.1%)	173 (45.6%)	
Secondary school	110 (14.6%)		48 (12.7%)	62 (16.4%)	
High school	114 (15.1%)		58 (15.4%)	56 (14.8%)	
College/University	37 (4.9%)		20 (5.3%)	17 (4.5%)	
Post graduate degree	8 (1.1%)		3 (0.8%)	5 (1.3%)	
Longest held occupation		*182*			**0.446**
Manual	231 (39.6%)		112 (40.1%)	119 (39%)	
Non manual	94 (16.1%)		40 (14.3%)	54 (17.7%)	
Unemployed (but able to work)	3 (0.5%)		0 (0%)	3 (1%)	
Unemployed (unable to work)	171 (29.3%)		85 (30.5%)	86 (28.2%)	
Homemaker	85 (14.6%)		42 (15.1%)	43 (14.1%)	
Housing tenure		*35*			**1.000**
Owners	677 (92.6%)		343 (92.7%)	334 (92.5%)	
Renters	54 (7.4%)		27 (7.3%)	27 (7.5%)	
People older than 18 living in household, median (IQR)	1 (1,2)	*304*	2 (1,2)	1 (1,2)	**0.087**
Mobile use (Yes)	433 (57%)	*6*	212 (55.6%)	221 (58.3%)	**0.503**
PC use (Yes)	167 (22.1%)	*9*	86 (22.8%)	81 (21.3%)	**0.683**
Alcohol		*146*			**0.001**
None	265 (42.7%)		105 (34.8%)	160 (50.3%)	
Less than 1/week	118 (19%)		68 (22.5%)	50 (15.7%)	
1-7/week	64 (10.3%)		31 (10.3%)	33 (10.4%)	
8-14/week	56 (9%)		35 (11.6%)	21 (6.6%)	
15-21/week	3 (0.5%)		0 (0%)	3 (0.9%)	
More than 21/week	114 (18.4%)		63 (20.9%)	51 (16.0%)	
Tobacco use		*8*			**0.088**
Never	438 (57.8%)		213 (56.2%)	225 (59.4%)	
Former	271 (35.8%)		134 (35.4%)	137 (36.1%)	
Current smoker	46 (6.1%)		29 (7.7%)	17 (4.5%)	
e-cigarette	0 (0%)		0 (0%)	0 (0%)	
Other	3 (0.4%)		3 (0.8%)	0 (0%)	
Height (cm)	162.48 (10.28)	*7*	163.14 (10.04)	161.82 (10.49)	**0.077**
Weight (kg)	77 (17.41)	*8*	79.04 (18.26)	74.96 (16.28)	**0.001**
Body Mass Index (BMI)	29.13 (6.01)	*8*	29.71 (6.43)	28.56 (5.51)	**0.009**
Heart rate (bpm)	73.71 (11.21)	*51*	72.97 (10.8)	74.45 (11.58)	**0.078**
Systolic blood pressure (mmHg)	131.69 (17.12)	*32*	129.64 (16.75)	133.75 (17.26)	**0.001**
Diastolic blood pressure (mmHg)	74.26 (10.14)	*32*	73.34 (10.74)	75.18 (9.44)	**0.013**
Oxygen saturation (%)	95.75 (2.56)	*87*	95.3 (2.69)	96.18 (2.36)	**<0.001**
Blood glucose (mg/dl)	128.66 (46.44)	*221*	131.82 (51.81)	125.49 (40.18)	**0.111**
HbA1c (%)	6.94 (0.99)	*508*	7.08 (1.04)	6.82 (0.92)	**0.036**
Creatinine (mg/dl)	1.07 (0.49)	*353*	1.07 (0.43)	1.06 (0.54)	**0.810**
Primary disease					
Primary disease CHF	202 (26.6%)	*7*	109 (28.5%)	93 (24.7%)	**0.262**
Primary disease COPD	238 (31.4%)	*7*	131 (34.3%)	107 (28.4%)	**0.094**
Primary disease DIABETES	306 (40.3%)	*7*	146 (38.2%)	160 (42.4%)	**0.267**
Secondary disease					
Secondary disease CHF	282 (37.1%)	*6*	157 (41.1%)	125 (33.1%)	**0.027**
Secondary disease COPD	174 (22.9%)	*6*	95 (24.9%)	79 (20.9%)	**0.224**
Secondary disease DIABETES	279 (36.7%)	*6*	124 (32.5%)	155 (41%)	**0.018**

Measurement	Total	Missing	Intervention	Control	p-value
Comorbidity ICD-10 codes					
Myocardial infarct	127 (16.8%)	*10*	75 (19.6%)	52 (13.9%)	**0.044**
Congestive heart failure	376 (50.1%)	*15*	194 (51.3%)	182 (48.8%)	**0.535**
Peripheral vascular disease	260 (34.5%)	*13*	154 (40.6%)	106 (28.3%)	**0.001**
Cerebrovascular disease	165 (21.8%)	*10*	94 (24.7%)	71 (18.9%)	**0.068**
Dementia	80 (10.6%)	*10*	48 (12.6%)	32 (8.6%)	**0.094**
Chronic pulmonary disease	356 (46.8%)	*5*	195 (51%)	161 (42.5%)	**0.022**
Rheumatic disease	82 (10.8%)	*7*	41 (10.7%)	41 (10.9%)	**1.000**
Peptic ulcer disease	49 (6.5%)	*9*	26 (6.8%)	23 (6.1%)	**0.834**
Mild liver disease	82 (10.8%)	*6*	41 (10.7%)	41 (10.9%)	**1.000**
Diabetes without chronic complication	320 (42.2%)	*7*	181 (47.3%)	139 (37%)	**0.005**
Diabetes with chronic complication	169 (22.4%)	*10*	86 (22.5%)	83 (22.3%)	**1.000**
Hemiplegia or paraplegia	52 (6.8%)	*5*	33 (8.6%)	19 (5%)	**0.072**
Renal disease	176 (23.3%)	*11*	95 (25%)	81 (21.6%)	**0.308**
Any malignancy	71 (9.5%)	*17*	45 (11.9%)	26 (7%)	**0.032**
Moderate or severe liver disease	73 (9.6%)	*9*	40 (10.5%)	33 (8.8%)	**0.512**
Metastatic solid tumor	4 (0.5%)	*18*	4 (1.1%)	0 (0%)	**0.124**
Barthel index, median (IQR)	100 (80,100)	*11*	95 (75,100)	100 (80,100)	**0.001**
GDS - Geriatric Depression Scale (Short Form)	4.29 (3.78)	*7*	4.47 (3.85)	4.11 (3.69)	**0.196**
Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.					

3.4.7.2 Analysis of demographic and clinical indicators, by group and gender

Additional analyses have been performed separately for men and women in order to assess the effect of gender on the baseline situation of patients.

Some relevant differences when gender is considered arise between intervention and control group. Females are older than men in both groups. Marital status is also different, with more women being widows in both groups. Relevant differences are observed when education level is considered, with women being less educated than men in both groups. There are no differences regarding technologies used.

Alcohol consumption is also different for men or women; for women, the most frequent condition is taking no alcohol at all. The same occurs with tobacco consumption, being almost absent among women.

There are also expected differences regarding body size, height, weight and BMI. No differences are found in clinical variables. Diabetes is the primary disease for women in both groups, and COPD the most frequent disease for men in the intervention group.

Regarding degree of dependence measured by Barthel Index, women are slightly more dependent than men. Women also present poorer results when mental health is explored. All these differences are shown in Table 17.

Table 17: Global: Baseline characteristics by group and by gender

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Sample size (n)	*185*	*196*		*176*	*204*	
Age	79.66 (7.87)	77.16 (7.45)	***0.002***	78.95 (7.95)	77.32 (7.34)	**0.040**
Marital status			***<0.001***			**<0.001**
Never married	5 (3.3%)	10 (5.6%)		6 (3.8%)	8 (4.6%)	
Currently married	71 (46.4%)	138 (77.5%)		66 (42.3%)	123 (71.1%)	
Separated	0 (0%)	2 (1.1%)		0 (0%)	2 (1.2%)	

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Divorced	1 (0.7%)	2 (1.1%)		2 (1.3%)	2 (1.2%)	
Widowed	75 (49%)	26 (14.6%)		81 (51.9%)	37 (21.4%)	
Cohabitating	1 (0.7%)	0 (0%)		1 (0.6%)	1 (0.6%)	
Education			***0.003***			**0.310**
Less than primary school	43 (23.6%)	20 (10.3%)		34 (19.4%)	32 (15.7%)	
Primary school	83 (45.6%)	102 (52.3%)		87 (49.7%)	86 (42.2%)	
Secondary school	24 (13.2%)	24 (12.3%)		24 (13.7%)	38 (18.6%)	
High school	21 (11.5%)	37 (19.0%)		20 (11.4%)	36 (17.6%)	
College/University	8 (4.4%)	12 (6.2%)		8 (4.6%)	9 (4.4%)	
Post graduate degree	3 (1.6%)	0 (0%)		2 (1.1%)	3 (1.5%)	
Longest held occupation			***<0.001***			**<0.001**
Manual	60 (42.6%)	52 (37.7%)		59 (40.4%)	60 (37.7%)	
Non manual	23 (16.3%)	17 (12.3%)		20 (13.7%)	34 (21.4%)	
Unemployed (but able to work)	0 (0%)	0 (0%)		1 (0.7%)	2 (1.3%)	
Unemployed (unable to work)	19 (13.5%)	66 (47.8%)		28 (19.2%)	58 (36.5%)	
Homemaker	39 (27.7%)	3 (2.2%)		38 (26%)	5 (3.1%)	
Housing tenure			***1.000***			**1.000**
Owners	165 (92.7%)	178 (92.7%)		150 (92.6%)	184 (92.5%)	
Renters	13 (7.3%)	14 (7.3%)		12 (7.4%)	15 (7.5%)	
People older than 18 living in household, median (IQR)	1 (1,2)	2 (1,2)	***0.042***	1 (1,2)	1 (1,2)	**0.219**
Mobile use (Yes)	96 (51.9%)	116 (59.2%)	***0.184***	97 (55.4%)	124 (60.8%)	**0.342**
PC use (Yes)	42 (23%)	44 (22.7%)	***1.000***	28 (15.9%)	53 (26%)	**0.024**
Alcohol			***0.042***			**<0.001**
None	60 (42.0%)	45 (28.3%)		102 (67.1%)	58 (34.9%)	
Less than 1/week	33 (23.1%)	35 (22.0%)		20 (13.2%)	30 (18.1%)	
1-7/week	13 (9.1%)	18 (11.3%)		14 (9.2%)	19 (11.4%)	
8-14/week	10 (7.0%)	25 (15.7%)		2 (1.3%)	19 (11.4%)	
15-21/week	0 (0%)	0 (0%)		1 (0.7%)	2 (1.2%)	
More than 21/week	27 (18.9%)	36 (22.6%)		13 (8.6%)	38 (22.9%)	
Tobacco use			***<0.001***			**<0.001**
Never	127 (69.8%)	83 (42.8%)		128 (73.1%)	96 (47.3%)	
Former	43 (23.6%)	91 (46.9%)		40 (22.9%)	97 (47.8%)	
Current smoker	11 (6%)	18 (9.3%)		7 (4%)	10 (4.9%)	
e-cigarette	0 (0%)	0 (0%)		0 (0%)	0 (0%)	
Other	1 (0.5%)	2 (1%)		0 (0%)	0 (0%)	
Height (cm)	161.36 (11.37)	164.83 (8.25)	***0.001***	159.15 (11.23)	164.12 (9.23)	**<0.001**
Weight (kg)	76.2 (16.31)	81.74 (19.6)	***0.003***	72.33 (15.92)	77.23 (16.29)	**0.003**
Body Mass Index (BMI)	29.44 (6.46)	29.96 (6.42)	***0.426***	28.63 (6.12)	28.5 (4.94)	**0.827**
Heart rate (bpm)	74.33 (10.08)	71.64 (11.33)	***0.018***	74.04 (11.58)	74.81 (11.6)	**0.530**
Systolic blood pressure (mmHg)	127.89 (15.82)	131.34 (17.48)	***0.048***	133.08 (17.5)	134.34 (17.08)	**0.486**
Diastolic blood pressure (mmHg)	74.31 (10.7)	72.4 (10.72)	***0.089***	74.95 (9.09)	75.39 (9.75)	**0.659**
Oxygen saturation (%)	95.52 (2.64)	95.1 (2.72)	***0.157***	96.44 (2.02)	95.95 (2.62)	**0.049**
Blood glucose (mg/dl)	129.92 (51.74)	134.01 (52)	***0.516***	127.4 (41.52)	123.71 (38.97)	**0.452**
HbA1c (%)	7.11 (1.03)	7.05 (1.06)	***0.751***	6.85 (0.87)	6.77 (0.99)	**0.637**
Creatinine (mg/dl)	1 (0.28)	1.15 (0.55)	***0.014***	1.09 (0.69)	1.02 (0.33)	**0.371**
Primary disease						
Primary disease CHF	61 (33.3%)	46 (23.5%)	***0.044***	52 (30.1%)	41 (20.2%)	**0.037**
Primary disease COPD	45 (24.6%)	86 (43.9%)	***<0.001***	40 (23.1%)	67 (33%)	**0.045**
Primary disease DIABETES	75 (41%)	70 (35.7%)	***0.343***	76 (43.9%)	83 (40.9%)	**0.624**

Measurement	Intervention			Control		
	Female	Male	p-value	Female	Male	p-value
Secondary disease						
Secondary disease CHF	73 (39.9%)	83 (42.3%)	***0.703***	53 (30.6%)	72 (35.5%)	**0.378**
Secondary disease COPD	43 (23.5%)	51 (26%)	***0.653***	39 (22.5%)	39 (19.2%)	**0.505**
Secondary disease DIABETES	56 (30.6%)	67 (34.2%)	***0.526***	68 (39.3%)	87 (42.9%)	**0.554**
Comorbidity ICD-10 codes						
Myocardial infarct	26 (14.1%)	47 (24.1%)	***0.020***	23 (13.2%)	29 (14.6%)	**0.820**
Congestive heart failure	101 (55.8%)	92 (47.2%)	***0.117***	91 (52.6%)	91 (45.7%)	**0.223**
Peripheral vascular disease	66 (36.3%)	85 (43.8%)	***0.165***	46 (26.6%)	60 (30%)	**0.540**
Cerebrovascular disease	44 (24.2%)	47 (24%)	***1.000***	32 (18.5%)	38 (18.9%)	**1.000**
Dementia	30 (16.3%)	16 (8.2%)	***0.024***	11 (6.4%)	20 (10%)	**0.279**
Chronic pulmonary disease	81 (44%)	112 (57.4%)	***0.012***	66 (37.7%)	94 (46.3%)	**0.114**
Rheumatic disease	19 (10.3%)	20 (10.2%)	***1.000***	21 (12.1%)	20 (10%)	**0.624**
Peptic ulcer disease	10 (5.4%)	15 (7.7%)	***0.489***	9 (5.1%)	14 (7.1%)	**0.578**
Mild liver disease	15 (8.2%)	25 (12.8%)	***0.196***	14 (8%)	27 (13.4%)	**0.129**
Diabetes without chronic complication	83 (45.1%)	97 (49.5%)	***0.452***	59 (34.3%)	80 (39.4%)	**0.361**
Diabetes with chronic complication	49 (26.6%)	37 (18.9%)	***0.093***	39 (22.5%)	44 (22.1%)	**1.000**
Hemiplegia or paraplegia	17 (9.2%)	16 (8.2%)	***0.862***	8 (4.6%)	11 (5.5%)	**0.871**
Renal disease	46 (25.1%)	48 (24.7%)	***1.000***	45 (25.9%)	36 (18%)	**0.086**
Any malignancy	14 (7.7%)	31 (16.1%)	***0.019***	16 (9.3%)	10 (5.1%)	**0.168**
Moderate or severe liver disease	16 (8.7%)	23 (11.7%)	***0.430***	13 (7.5%)	20 (10%)	**0.498**
Metastatic solid tumour	1 (0.6%)	3 (1.6%)	***0.624***	0 (0%)	0 (0%)	**1.000**
Barthel index, median (IQR)	90 (65,100)	100 (85,100)	***<0.001***	97.5 (75,100)	100 (90,100)	**0.002**
GDS - Geriatric Depression Scale (Short Form)	5.23 (4.27)	3.77 (3.28)	***<0.001***	4.56 (3.64)	3.68 (3.66)	**0.020**

Quantitative data presented as mean (SD) and qualitative data presented as frequencies (%), unless otherwise indicated.

3.4.7.3 Analysis PIRU by group

Significant differences can be found between intervention and control groups in almost all the questions with controls being more satisfied with the usual received care. This overall result is not observed when sites are assessed separately. Basque Country and North Silesia present significant differences between groups with the intervention group being more satisfied than the control one. In Puglia the differences are also relevant, but in these cases the control group is much more satisfied. Finally Croatia and Veneto do not present this kind of difference. The presence of this difference is probably unavoidable at this point; so, it has to be considered in the discussion of the results regarding the PIRU questionnaire. If a bias was introduced, this would reduce the size of the difference of the effect of the intervention between intervention and control group. So, any positive result will be present in spite of the potential bias.

Considering the questions of the PIRU questionnaire individually, the first set of questions that explore the perceived involvement of the patients and carers in the decision making process related to the care provision is very positive, more so among the controls. When information and treatment review is explored, satisfaction is not so high, and is lower for intervention patients. And finally, when access to care and to other services is explored, results are variable, tending to medium satisfaction, again lower for intervention patients.

Table 18: Global: Baseline PIRU questionnaire by group

Measurement	Total	Missing	Intervention	Control	p-value
Have all your needs been assessed?		*7*			**0.008**
All of my needs have been assessed	535 (70.5%)		248 (65.1%)	287 (75.9%)	
Some of my needs have been assessed	201 (26.5%)		118 (31%)	83 (22%)	
None of my needs have been assessed	7 (0.9%)		4 (1%)	3 (0.8%)	
Don't know/can't remember	16 (2.1%)		11 (2.9%)	5 (1.3%)	
Were you involved as much as you wanted to be in decisions about your care and support?					
		5			**<0.001**
Yes, definitely	526 (69.1%)		249 (65.4%)	277 (72.9%)	
Yes, to some extent	180 (23.7%)		117 (30.7%)	63 (16.6%)	
No	55 (7.2%)		15 (3.9%)	40 (10.5%)	
Were you involved as much as you wanted to be in decisions about your treatment?					
		5			**0.032**
Yes, definitely	518 (68.1%)		248 (65.1%)	270 (71.1%)	
Yes, to some extent	216 (28.4%)		123 (32.3%)	93 (24.5%)	
No	27 (3.5%)		10 (2.6%)	17 (4.5%)	
Were your family or carer involved in decisions about your care and support as much as you wanted them to be?					
		5			**0.006**
Yes, definitely	524 (68.9%)		252 (66.1%)	272 (71.6%)	
Yes, to some extent	168 (22.1%)		103 (27%)	65 (17.1%)	
No	25 (3.3%)		9 (2.4%)	16 (4.2%)	
There were no family or carers available to be involved	30 (3.9%)		13 (3.4%)	17 (4.5%)	
I didn't want my family or carer to be involved in decisions about my care and support	14 (1.8%)		4 (1%)	10 (2.6%)	
Were your family or carer involved in decisions about your treatment as much as you wanted them to be?					
		6			**<0.001**
Yes, definitely	531 (69.9%)		253 (66.4%)	278 (73.4%)	
Yes, to some extent	157 (20.7%)		102 (26.8%)	55 (14.5%)	
No	19 (2.5%)		7 (1.8%)	12 (3.2%)	
There were no family or carers available to be involved	31 (4.1%)		12 (3.1%)	19 (5%)	
I didn't want my family or carer to be involved in decisions about my treatment and support	22 (2.9%)		7 (1.8%)	15 (4%)	
Overall, do you feel that your carer/family has had as much support from health and social services as they needed?					
		9			**<0.001**
Yes, they have had as much support as they needed	436 (57.6%)		211 (55.5%)	225 (59.7%)	
They have had some support but not as much as they needed	175 (23.1%)		119 (31.3%)	56 (14.9%)	
No, they have had little or no support	31 (4.1%)		20 (5.3%)	11 (2.9%)	
They did not want/need support	95 (12.5%)		24 (6.3%)	71 (18.8%)	
There are no family members or carers to support	20 (2.6%)		6 (1.6%)	14 (3.7%)	

Measurement	Total	Missing	Intervention	Control	p-value
To what extent do you agree or disagree with the following statement...'Health and social care staff always tell me what will happen next'					
		7			**<0.001**
Strongly agree	349 (46%)		146 (38.4%)	203 (53.6%)	
Agree	247 (32.5%)		146 (38.4%)	101 (26.6%)	
Neither agree nor disagree	124 (16.3%)		72 (18.9%)	52 (13.7%)	
Disagree	36 (4.7%)		14 (3.7%)	22 (5.8%)	
Strongly disagree	3 (0.4%)		2 (0.5%)	1 (0.3%)	
When health or social care staff plan care or treatment for you, does it happen?					
		10			**0.015**
Yes, it happens all of the time	478 (63.2%)		219 (57.9%)	259 (68.5%)	
It happens most of the time	226 (29.9%)		132 (34.9%)	94 (24.9%)	
It happens some of the time	42 (5.6%)		23 (6.1%)	19 (5%)	
No	10 (1.3%)		4 (1.1%)	6 (1.6%)	
To what extent do you agree or disagree with the following statement...'My care and support is reviewed as often as it should be'					
		8			**<0.001**
Strongly agree	424 (55.9%)		189 (49.6%)	235 (62.3%)	
Agree	269 (35.5%)		163 (42.8%)	106 (28.1%)	
Neither agree nor disagree	51 (6.7%)		23 (6%)	28 (7.4%)	
Disagree	12 (1.6%)		4 (1%)	8 (2.1%)	
Strongly disagree	2 (0.3%)		2 (0.5%)	0 (0%)	
To what extent do you agree or disagree with the following statement...'My treatment is reviewed as often as it should be'					
		6			**<0.001**
Strongly agree	425 (55.9%)		186 (48.8%)	239 (63.1%)	
Agree	274 (36.1%)		167 (43.8%)	107 (28.2%)	
Neither agree nor disagree	48 (6.3%)		23 (6%)	25 (6.6%)	
Disagree	10 (1.3%)		4 (1%)	6 (1.6%)	
Strongly disagree	3 (0.4%)		1 (0.3%)	2 (0.5%)	
To what extent do you agree or disagree with the following statement...'My medicines are thoroughly reviewed as often as they should be'					
		5			**<0.001**
Strongly agree	417 (54.8%)		179 (47%)	238 (62.6%)	
Agree	266 (35%)		157 (41.2%)	109 (28.7%)	
Neither agree nor disagree	61 (8%)		34 (8.9%)	27 (7.1%)	
Disagree	14 (1.8%)		10 (2.6%)	4 (1.1%)	
Strongly disagree	3 (0.4%)		1 (0.3%)	2 (0.5%)	
Do you have a named health or social care professional who co-ordinates your care and support?					
		6			**0.012**
Yes	599 (78.8%)		284 (74.7%)	315 (82.9%)	
No, I co-ordinate my own care and support	112 (14.7%)		70 (18.4%)	42 (11.1%)	
Don't know/not sure	49 (6.4%)		26 (6.8%)	23 (6.1%)	

Measurement	Total	Missing	Intervention	Control	p-value
If you have questions, when can you contact the people treating and caring for you? Please tick ALL the apply					
		10			**0.008**
During normal working hours	720 (95.2%)		352 (92.9%)	368 (97.6%)	
During the evening	15 (2%)		12 (3.2%)	3 (0.8%)	
During the night	0 (0%)		0 (0%)	0 (0%)	
Weekends	0 (0%)		0 (0%)	0 (0%)	
Don't know/not sure	21 (2.8%)		15 (4%)	6 (1.6%)	
Do you feel this person understands about you and your condition?					
		10			**<0.001**
Yes, definitely	570 (75.4%)		264 (69.7%)	306 (81.2%)	
Yes, to some extent	178 (23.5%)		113 (29.8%)	65 (17.2%)	
No	8 (1.1%)		2 (0.5%)	6 (1.6%)	
Do all the different people treating and caring for you work well together to give you the best possible care and support?					
		12			**<0.001**
Yes, all of them work well together	491 (65.1%)		223 (58.7%)	268 (71.7%)	
Most of them work well together	200 (26.5%)		115 (30.3%)	85 (22.7%)	
Some of them work well together	48 (6.4%)		36 (9.5%)	12 (3.2%)	
No, they do not work well together	4 (0.5%)		0 (0%)	4 (1.1%)	
Don't know/not sure	11 (1.5%)		6 (1.6%)	5 (1.3%)	
Do health and social care services help you live the life you want as far as possible?					
		10			**0.016**
Yes, definitely	391 (51.7%)		178 (47%)	213 (56.5%)	
Yes, to some extent	324 (42.9%)		182 (48%)	142 (37.7%)	
No	41 (5.4%)		19 (5%)	22 (5.8%)	
To what extent do you agree or disagree with the following statement...'In the last 12 months, health and social care staff have given me information about other services that are available to someone in my circumstances, including support organisations'					
		6			**<0.001**
Strongly agree	205 (27%)		68 (17.8%)	137 (36.1%)	
Agree	243 (32%)		143 (37.5%)	100 (26.4%)	
Neither agree nor disagree	144 (18.9%)		64 (16.8%)	80 (21.1%)	
Disagree	163 (21.4%)		103 (27.0%)	60 (15.8%)	
Strongly disagree	5 (0.7%)		3 (0.8%)	2 (0.5%)	

4. Process evaluation

An evaluation of processes related to the implementation of CareWell services was planned alongside the outcome evaluation described in deliverable D7.1. The aim of the process evaluation is to collect data to enable an understanding of the barriers and facilitators for implementing ICT-supported integrated care.

4.1 Description of context and care-as-usual

This is described in the section 2 above, Domain 1: Description of the health problem and characteristics of the application of the intervention.

4.2 Identification of barriers and facilitators

4.2.1 Basque Country

	5-6 months after implementation	
	Facilitators	**Barriers**
Technical		
	Adaptation of technologies that are already implemented in the organisation.	Patients are not informed properly about the different tools that they can use; the dissemination strategy of the technology has not been performed adequately.
	Healthcare professionals know about the technologies.	Cultural change in the use of technology is slow, healthcare professionals show resistance to change.
	The empowerment programme for patients has been deployed in the Personal Health Folder of each patient and designed in an attractive style; therefore it can be used easily by patients.	There is not a single tool for the management of patients, but a variety of tools in the different levels of care (primary care, hospital care, pharmacy, etc.) which can impede the activity of professionals because the patient information can be in different places, therefore the professional must search the different systems.
Organisational		
	Collaboration between the professionals.	Complexity of the intervention.
	Multidisciplinary teams (health professionals, directors and technicians) participated in the design of the intervention, so all stakeholders' needs and perspectives were considered.	New model in the organisation with the integration of primary care and hospital in the integrated healthcare systems.
	Design of the intervention by professionals of different organisations who are going to implement it, so the intervention is adaptable and flexible enough to be tailored to all contexts.	Resistance to the change in the management teams.

	5-6 months after implementation	
	Facilitators	**Barriers**
	Correlation between the objectives of the intervention and the strategic lines of health plan.	Existence of similar interventions may cause confusion among practitioners.
	The central organisation of Basque Health services recognises the need to implement the CareWell service.	
	Support of lead clinicians in the definition of the intervention provides the project with scientific evidence and validation.	
Administrative		
	Existence of a field trial coordinator during the implementation, who monitored the process and coordinated all stakeholders, was essential to ensure the successful deployment.	Implementation of the intervention in three different integrated health organisations of the Basque Country. These organisations are located in different geographical areas which are distant from each other, which can make communication between the professionals who are part of the deployment difficult.
	Participation and support of general managers in the design of the intervention can hasten deployment.	The job positions of professionals can suffer changes during the implementation which can make deployment difficult.
		Primary care level and hospital level have been integrated in Integrated Health Services organisations which has caused changes in the management teams.
Economic		
	The intervention is part of a project funded by the European Commission.	Economic crisis in the Basque Country which could make the implementation of new strategies difficult.
	The intervention is aligned with the strategy of the Basque Government, and therefore supported by policy makers.	
	Up-scaling the intervention does not require a significant investment. Most of the changes are related to task shifting and redefinition of roles.	

4.2.2 Croatia

	5-6 months after implementation	
	Facilitators	**Barriers**
Technical		
	An app guide for system usage (step-by step).	Adaptation time to new technology for nurses and GPs.

	Availability of patient data regardless of location and time.	Initial technical (ICT) readiness in GP offices.
	Automatic data transfer after patient visit.	Medical equipment issues (ECG transfer not executed consistently).
	App collaboration possibilities between field nurse and GP.	Patients were not used to Android apps, so initial usage of education materials was low.
	Integration with standard GP office system for easy data access.	
Organisational		
	Strong support from the head of healthcare centre and head of field nurses.	Healthcare centre (DZZC) not being an official CareWell project beneficiary.
	Healthcare centre support in legal and ethical issues (informed consent document and ethical committee approval).	Control group of patients needed to be selected from GP practices that are not in the healthcare centre (DZZC) organisation and not participating in CareWell project.
	Healthcare centre staff involved in service design and service delivery procedures.	
Administrative		
	Cooperation contract between all Croatia pilot project beneficiaries and healthcare centre (DZZC) as healthcare service delivery organisation.	Legal and ethical procedure for patient recruitment (informed consent and ethical committee approval).
Economic		
	Budget for implementation covering all devices and mobile communication costs for patients and medical professionals.	Compensation to GPs and field nurses for project participation not included in CareWell budget.
	New service provided free of charge to patients.	

4.2.3 Lower Silesia

	3 months after implementation	
	Facilitators	**Barriers**
Technical		
	Three platforms were implemented to support patients to stay at home: • monitoring platform; • information / education platform; • integration platform.	Mobile devices are connected with smartphones vie Bluetooth. This pairing is unstable in the case of low quality smartphones.
	Telemedicine equipment works well (glucometer, peak flow meter. hypertension meter, pulse-oxymeter weight scales))	

	Technical support is carried out by external company and hospital ICT technicians respectively.	
Organisational		
	Support from the political leadership of Marshal Office for the pilot at Geriatric Centre at A. Falkiewicz specialist hospital.	So far, National Health Fund does not finance the telecare and social care
	Hospital professionals working together in Project Team (nurses, physicians, and social worker) are well trained, and cooperate effectively through the platform.	Permanent personnel in administration / finance departments are not supporting the implementation of the pilot as it should be.
Administrative		
	Small and effective Project Team is engaged in the Project.	Tender procedures were time consuming to finalise documents for contractual agreement with contractors.
		Long time periods for platforms implementation and testing.
Economic		
		Financing procedures between Marshal Office and its third party implementation site takes too much time.
		Changing exchange rates affect the spending plan.

4.2.4 Veneto

	<5 months after implementation	
	Facilitators	**Barriers**
Technical		
	The solution designed has been appreciated by most of the healthcare professionals involved for the ease of use.	The solution first planned was not implementable. A new solution was designed and implemented, but it took more time than planned initially.
		Technical integration has been difficult due to multiple platforms and software used in within the Local Health and Social Authority information systems.
		Management of multiple contractors: some parts of the information system are contracted to different companies.
		Ensuring the safety of external connection from devices to the central systems.

	<5 months after implementation	
	Facilitators	**Barriers**
Organisational		
	Support from several early adopters / technology enthusiasts.	From the healthcare professionals involved, some resistance to change was noted.
Administrative		
	Expertise in the management of large and complex European projects in the field of healthcare.	Public procurement guidelines and regulations slow the process of acquiring the necessary components.
	Compliance between the project objectives and the Regional Health and Social Care Policy 2012-2016	
	Incentives to the GPs to stimulate enrolment.	
Economic		
	The medium – long term financial viability of the system has been proven to be a good driver in the design of the intervention.	

4.2.5 Puglia

	5-6 months after implementation	
	Facilitators	**Barriers**
Technical		
	The devices facilitated circulation of information; this represented an incentive to use them.	Technical problems were mainly the usability by professionals of the devices and the ICT connections. Similar problems for the elderly who were partly diffident, partly unable. Some areas were not properly covered by internet connection, therefore slow transmission.
	Knowledge of technology by healthcare professionals.	Some glucometers not accurate in reading glycaemia. Failure in the transmission of data for glucometer.
	Implementation of an empowerment programme for patients.	Systems not always appropriately calibrated and adjusted. Possibility to check repeated transmission only later on the platform, and not in real time.
		Need for adequate preparation and availability of healthcare professionals.
		Cultural change in the use of technology is slow.

	5-6 months after implementation	
	Facilitators	**Barriers**
Organisational		
	Support from head of section.	Some stakeholders unwilling to participate.
	Good training, good team spirit, and great enthusiasm in testing the use of devices.	At the beginning, use of devices implied more time to spend at patient home; this had an important impact in the organisation of daily work.
	No incentives were given.	Complexity of the intervention.
	Synergy between professionals.	
Administrative		
	Strong involvement in the pilot of the Care management team	No easy integration between primary care and hospital level.
	The participation and support of general managers can facilitate the implementation of the programme.	Management of the delivery of devices at patient's home, and acquisition of consumables.
Economic		
	A budget for implementation was given.	No incentives to professionals were given.
	No budget was given, because the organisational model was already in place	We did not consider that devices used a lot more consumables that were not include in the initial budget.
	New service provided free of charge to patients.	

4.2.6 Powys

	5-6 months after implementation	
	Facilitators	**Barriers**
Technical		
	Adaptation of technologies that are already implemented in the organisation.	Patients were not informed properly about the different tools that they could use; the planned use of the technology has not been adequately implemented.
	Healthcare professionals know about the technologies.	Cultural changes in the use of technologies are slow; healthcare professionals show resistance to change, especially where they are not familiar with modern technology.
	The empowerment programme for patients has been deployed but use by both the healthcare professionals and patients is poor.	The is no data available at present to monitor the use / frequency of use of the chosen solution; the project team are working to address this with the provider.

	5-6 months after implementation	
	Facilitators	**Barriers**
		The uptake of registration of the chosen solution is slow, this is being addressed via patient workshops in January 2016.
		The chosen solution is perceived to have technical / integration issues by the GP practices.
Organisational		
	Collaboration between the professionals.	Complexity of the intervention.
	Correlation between the objectives of the intervention and the strategic lines of health board IMTP and priority setting.	A need to strategically align these to the Health Board IMTP.
	Support of lead clinicians in the definition of the intervention provides the project with scientific evidence and validation.	Existence of ICT solutions with similar functionality available is causing confusion among practitioners. A clear scope / directions is required to address this.
		The complexity and requirement to complete various given tools is a deterrent for key stakeholders.
Administrative		
	This is part of an European funded project.	Economic crisis & financial pressures.
	The up-scaling of the intervention does not require a significant investment. Most of the changes are related to task shifting and redefinition of roles.	Primary care level and hospital level have been integrated in Integrated Health Services organisations which has caused changes in the management teams.
	Participation and support of general managers in the design of the intervention can hasten deployment.	
Economic		
	The intervention is part of an European project.	Economic crisis
	The up-scaling of the intervention does not require a significant investment. Most of the changes are related to task shifting and redefinition of roles.	

4.2.7 Global overview

	5-6 months after implementation	
	Facilitators	**Barriers**
Technical		
	Use of technologies already implemented. Co-design with professionals and end users. Easy and appealing user experience. Technical literacy of the professionals. Technology enables collaboration among professionals.	Adaptation to new technology by all users. Readiness and maturity of the ICT solutions. Communication protocols between devices and systems. Integration of multiple systems and contractors.
Organisational		
	Collaboration and synergies among professionals and different organisations. Alignment with existing programmes or strategies. Support of lead clinicians and early adopters in the design and planning of the services. Maturity of vertical integration.	Complexity of the health and social care systems. Resistance to change by all users. Complexity of interventions in the field of integrated care. Complex requirements for tools adoption.
Administrative		
	Participation of top management in the design of the intervention. Support of the policy makers. Compliance with existing policies, laws and national / regional plans. Compliance with regional or upper level long term plans with payers or other organisations.	Public procurement. Management of multiple contractors. Legal and ethical procedures. Integration of different organisations.
Economic		
	Co-funding by the European Commission. Long term business viability analysis. Service free of charge for patients.	Economic crisis and trends. Planned budget vs real budget. Financial procedures in public organisations. Telecare, eHealth and mHealth funding policies.

4.3 Healthcare professionals perceptions

During the implementation process, the person(s) responsible for project management and implementation at each site have been interviewed and asked to provide information on the implementation progress, as well as any facilitators and barriers experienced. The interviews aimed to obtain the opinions of individuals related to their perception and experience on the care provided to help understand the context, characteristics and main factors of care being deployed. The care process was studied by means of semi-structured interviews and records of care targeting professionals actively involved in the ICT supported integrated care (nurses, hospital doctors, home nurses, social workers and GPs).

A total of 32 semi-structured interviews of 45-60 minutes were performed; Basque Country carried out eight interviews, Croatia six, Lower Silesia six, Veneto three, Puglia six and Powys three.

4.3.1 Basque Country

Professionals with the most important role in the CareWell care pathway have been interviewed including: primary care nurse, advanced practice nurses (primary level), liaison nurses (hospital level), primary care physicians, supervisor of the telehealth service, and reference internist. The professionals worked in the different care levels and in the different integrated health care organisations participating in CareWell.

All professionals agree that the care model for multimorbid patients has changed a lot from a paternalist model to a new model where the patient and caregiver are in the centre of the care. The communication and coordination between the different care levels have improved through the use of ICTs. However, there are still some tools that are not well interconnected. The professionals have to access to different platforms if they want to find information from primary care or hospital care, though they can find all the information related to each patient and have a global vision of the patient´s pathway at anytime. A lot of ICT resources are available in order to get patient information; these includes:

- Osabide AP (EHR for primary care);
- Global Clinic (repository of analytics, reports, etc.);
- Osanaia to share nursing information and nursing care plans;
- Presbide for drug prescription; and
- Osabide Global where primary care and hospital care can share information.

Non face-to-face interconsultations are frequently used by professionals of the different levels and those at the telehealth services. Using this tool, patient information can be shared and problems can be solved more straightforwardly and quickly. The use of ICTs optimises resources and management of the health system, and especially patient management. Phone calls and non face-to-face consultations allow a reduction in the number of visits and travels. Moreover, ICTs enable more interaction and communication between primary care and hospital, and the relationship with the telehealth service is much more flexible and accessible. The telehealth service has open channels to call specialists, and has the possibility to communicate with both primary care and hospital physicians.

An empowerment programme for multimorbid patients (KronikON system) has been developed based on the analysis of needs performed in the early stages of the project. This system is integrated with the Personal Health Folder of each patient participating in CareWell, and is available for all multimorbid patients, caregivers, citizens and professionals of the Basque Country through the Osasun Eskola webpage which is the Osakidetza web portal. Moreover, the implementation of CareWell has promoted the use of Osagune, which is a collaborative space supporting communication between the professionals involved in CareWell project to resolve doubts, revise protocols, etc.

CareWell project has improved the coordination and communication between the primary care and hospital care when a patient is discharged from the hospital. The core of CareWell is putting the patient in the centre of care, and boosting his/her empowerment, led primarily by primary care nurses.

4.3.2 Croatia

The professionals are GPs and field nurses who are in everyday contact with chronic patients and take care of their care plan. Some experience more increase in responsibility, but generally speaking the level has stayed the same. Workflow has

generally stayed the same. Everyone says that it makes their job much easier and are more involved.

Most use a wide spread system called MCS which unites patient records. They all also use Ericsson mobile health on this project.

The professionals are extremely satisfied with the level of coordination in their care for the patient. Everything has improved: communication, faster response rate, their involvement in the patients' care, a wider number of tools used for measurements; everyone would like it to be the standard for patients with chronic diseases. In most cases, communication has improved; in others, it has stayed pretty much the same, which depends on the proximity of field nurse and GP.

In general, patients have become more empowered in the sense that they take a greater interest in their own health. They monitor their own measurements, watch educational materials, and seem really interested to be a part of a project like this. Some professionals say that their mental strength has gone up. They have a feeling of control and importance.

4.3.3 Lower Silesia

Integrated care plan in Lower Silesia is based on three platforms: monitoring; integration; and education/communication, including mobile communication / information application. All these services should empower patients to stay independently at home.

At the enrolment stage, fully monitoring and integration platforms were implemented. This is why that there is initial knowledge on the care plan based on these two platforms. So far the responsibility and tasks have not changed. It results in a care model which was implemented with the current knowledge of professionals. They need to master current functionalities. They were expecting more functionalities based on ICT.

The major change is based on creating a call centre (Contact Centre). The CC worker is responsible for communication / information issues. Implementation of mobile devices for live parameter measurements and transfer to the integrated platform needs more time to be appreciated.

Professionals at A. Falkiewicz specialist hospital have basic knowledge on using the ICT. They are familiar with how to use smart phones and internet services such as e-mail and searching for information.

From a long time, ICT has played an important role in protecting health and contributing to widespread access to electronic medical records; this information site is not the only one. ICT also provides access to clinical guidelines, recognised as the standard of care, and other clinical data such as scientific articles. There is a big difference between web pages and platforms. The platform supports healthcare through its functions and information made available selectively for patient and professionals.

A duty of the Contact Centre is to coordinate all activities within the integrated platforms. The mobile application will empower patients with data on disease information / communication and social services. Exchange of information by e-mail and the communication service of the mobile application will support professionals. With quick access to information, it will connect them with patients and other professionals.

Social services support is the biggest challenge in Lower Silesia. So far there were no such implementations to empower patients with social services. Using the mobile application, a patient can order some services such as cleaning, shopping to ordering some food, and many others.

4.3.4 Veneto

All the interviews showed the existence of knowledge of the care pathway that has been implemented. Each professional has maintained their role in the pathway of the patient, but mentioned an improvement in the cooperation and the effectiveness of the actions undertaken by all the actors involved in the process of care for frail and multimorbid patients.

The interviews showed an improvement in the communication and coordination among professionals of primary and secondary care. The workflows appear smoother and faster.

The ICT solution appears to be appreciated by the professionals. Even if at an early stage of deployment, positive changes are seen in the interviews. Coordination of care appears to be improved with the introduction of the ICT solution.

A better attitude to cooperate between professional is noted in the interviews. It seems that the more information the professionals receive from each other on activities, the more details would be known, in order to improve the care of the patients. It was mentioned twice that there is the hope that this will be one step forward; it appears that once the professionals discover that improvements in integration of data are possible, the need will increase.

Due to the kind of patients that have been selected and to the early stage of deployment, changes are minor at the moment.

4.3.5 Puglia

In Puglia the care programme was already in place. The care team was involved in the deployment of the CareWell care pathway, and interviews were performed with Care Managers (specialised nurses), GPs and specialists involved in the project.

From the interviews it is very clear that they all agree that the introduction of ICT tools and remote monitoring facilities and communication makes it possible to give quicker answers to patients about possible changes in the care plan, and quicker decisions among professionals involved on patients' needs.

There was a relevant reduction in the number of phone calls and visits to patient's home, and also more focused questions from patients and between colleagues.

All agreed that it makes it easy to access data and patient’s information.

They also agreed that at the beginning there was quite a lot of diffidence from patients in using devices; they had to perform a role play at the patient’s home to improve confidence. But after that, patients appeared to be happy to be able to self-monitor. The use of devices improved, and facilitated contact with patients who were happier and more compliant.

Doctors (GPs and specialists) found the devices easy to use, and felt very confident using them.

They did not notice very much improvement of the empowerment process because in Puglia care programme, the empowerment process in based mainly on counselling performed regularly by Care Managers. Six months was not a long enough time to understand whether the introduction of devices improved the empowerment process that was already at a good level.

4.3.6 Powys

GP practices in Wales provide services under contract to Local Health Boards. As well as giving advice about health and illnesses, GPs might also provide contraceptive services, vaccinations, maternity services and minor surgery. GPs included within the pilot play a crucial role in the deployment and use of the Powys CareWell ICT solutions and how they

are used within the practice and with their patients / healthcare professionals; we have interviewed these key professionals.

All of the professionals who were interviewed agree that the delivery of our CareWell related services in Powys provide better options for care of patients and patient empowerment, whilst keeping the patient and caregiver at the centre of care. The communication and coordination between the different care levels have improved through the use of the ICT solutions being deployed. However, there is and has been very little uptake so far in the use of the solutions, this is mainly due to the delays in recruitment, but also to delays in deploying the relevant ICT solutions within our health board.

The professionals have access to different tools to find information from primary care or hospital care (i.e. MS Lync / Skype for Business, My Health Online, and web pages developed to support education and trusted sources of information). They do not currently have visibility of all information related to each patient, nor do they have a global vision of the patient pathway at anytime. This unfortunately will not be achievable during the lifespan of this project, but NHS Wales and Powys Teaching Heath Board will be implementing WCCIS throughout 2016-2017 that will support this.

There are many ICT resources already available to healthcare professionals in Powys in order to get patient information; these include: EMIS for primary care information, Myrddin for hospital care history and patient management information, IFOR (Intelligence Focused Online Reporting) for analytical, performance and validation reports. Unfortunately not all these systems are interoperable at present and the information for each is stored in isolation. Consultations via video conferencing (i.e. non face-to-face) have commenced within Powys, however we are yet to identify the specific need to hold these with any of the CareWell patient cohort, something that we will be doing throughout Year 3 of the project. Video conferencing is used a lot for the professionals of the different levels within the organisation using telehealth solutions to support this.

The use of ICT optimises resources and management of the health system, and especially patient management. Phone calls and non face-to-face consultations support us in providing care closer to the home, focused on individual needs; it can also reduce the number of visits / travel required by both the patient and the Health Board / care giver. All professionals agreed that the ICT being deployed makes communication between primary care, the hospital and the wider service more flexible and accessible.

An empowerment programme for our CareWell cohort has been developed based on the needs of the patient, and with consideration of the existing ICT solutions available in Wales / Powys. This programme focuses on the deployment and use of My Health Online and Info Engine. It is available to all patients, caregivers and professionals within Powys Teaching Health Board. The solutions are accessible via web pages on the world wide web. The use of these ICT solutions is very varied; at this stage it is therefore very difficult to assess how useful these solutions are, and even to know how often they are accessed. We are currently working with the provider to develop KPI measures to assist in this; however professionals are confident that these solutions will have a positive impact to the patient experience and will support patients in understanding their conditions and symptoms, potentially with a lesser need or reliance on patients requiring physical presence at the GP practice.

The Powys CareWell project has improved the accessibility of coordination and communication between its services and patients within Powys. It also has solutions available to support better patient understanding and empowerment; however it is very clear that to fully assess the success of this, there is much further work required through Year 3 of the project.

4.3.7 Overview across sites

Professionals from all the different sites point out that after the deployment of CareWell, coordination and communication among professional has clearly improved, and so have work processes and the use of services. It was perceived that this improved cooperation and communication between professionals had a positive impact in patients' care experience.

Patients are being empowered, but professionals do not feel there is a change in their role. In one case, the relationship between patient and professionals has been mentioned as changed, shifting from a patronising model towards a shared decision making one. Some of those interviewed affirm that they have not seen a reduction in their work load; but improvements in information access and integration are claimed.

However professionals have an overall awareness of the impact and benefits of integrated care.

5. Predictive modelling

5.1 Introduction

The objective of this work is to integrate predictive modelling in the form of Budget Impact Analysis (BIA) within the Deming's plan-do-check-act (PDCA) cycle to manage continuous improvement in the implementation of integrated healthcare for multi-morbid patients. The aim of this approach is to evaluate large populations of individuals. This framework was tested first in the Donostialdea Country (Basque Country) and is currently on-going for the whole population of the regions of Basque Country and Veneto.

The logic of this approach lies in the fact that organisations are dynamic entities that evolve over time. The adoption curve of an innovation has an S shape, with an early slow phase affecting very few people, a rapid middle phase with wide spread, and a slow third phase that ends with incomplete implementation. This means that a substantial 'steady-state' period during which the intervention could be evaluated is unlike to be attained. This is, if we carry out effectiveness analysis based on a static view of the situation, we risk stating that the intervention has barely been effective and discontinue it.

The rationale we propose is to carry out an interactive approach to the economic evaluation by revising systematically the expect results.

5.2 The framework

We carried out a study that projected the burden of multi-morbid patients in a traditional healthcare organisation, and analysed how this would change if integrated healthcare achieved the goal of keeping patients' conditions stable longer. Predictive modelling helped us delimit the budget impact of the integrated healthcare intervention according to the organisationally defined goals by comparing both scenarios (Plan stage).

Once the intervention was deployed (Do stage), a statistical analysis was carried out to ascertain any changes in resource consumption in the following years (Check stage). Additionally, the real costs together with the objective cost set in the plan stage determined whether the trend was positive or not. If the intervention achieved the objective, then that would become the new standard (baseline) for how the organisation should act going forward. On the contrary, if the check stage showed no improvement, then the existing standard will remain and adjustments or corrective actions need to be made (Act stage).

The following Figure 12 shows graphically the framework that integrates simulation modelling and statistical analysis to check at each stage the distance between our results and the objectives.

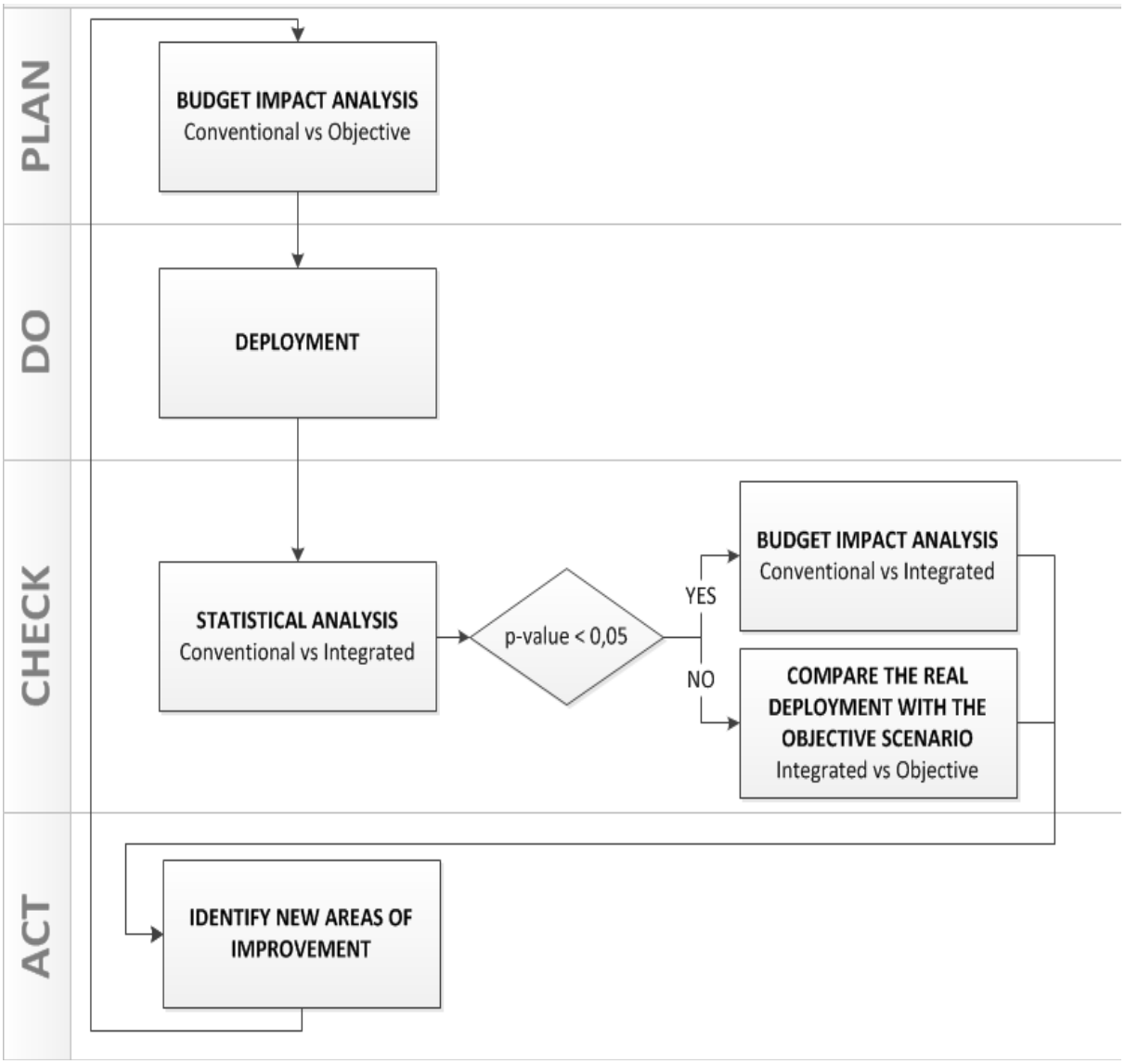

Figure 12: Description of the model

5.2.1 Predictive modelling

Simulation is the imitation of the operation of a real-world process or system over time to show the eventual real effects of alternative conditions and courses of action. This computer simulation is an attempt to model a real-life or hypothetical situation on a computer so that it can be studied to see how the system works. By changing variables in the simulation, predictions may be made about the behaviour of the system. It is a tool to virtually investigate the behaviour of the system under study. In the case at hand, we would like to study how the care of multi-morbid patients under integrated healthcare would change compared to baseline care (traditional healthcare).

We started by building up the mathematical functions which described the pathways that the patients followed under traditional healthcare. The model presented is a dynamic multi-cohort model that includes all the prevalent and incident multi-morbid patients. The patients who were eligible for the new organisational model at the beginning of the implementation were considered the prevalent cohort; they represented the initial target population. New patients who would become eligible for complex care in the future constituted incident cohorts. Prevalence data by gender and age were obtained from administrative databases, and mortality was adjusted by the incremental death risk of multi-morbid patients.

Knowing our population prevalence and mortality, we estimated incidence rates by age group using Dismod II software[13]. Dismod II is a tool created by the World Health Organization to measure the consistency of estimates of incidence, prevalence, duration and case fatality for diseases by exploiting the causal relations between the various variables that describe a disease process. We determined the patients' entry into the model by multiplying the incidence rates of each age group by the estimated population. Projections of the National Institute of Statistics of Spain (INE) were used to determine the Spanish multi-morbid population between 2015 and 2020.

We validated the model by taking the resource consumption rates as the key results. Validity is the degree to which a model or simulation is an accurate representation of the real world from the perspective of the intended uses of the model or simulation. The model was validated by comparing the simulated outpatient clinics, Accident and Emergency (A&E) and hospitalisation rates with the observed ones. The model was assessed by using the following goodness-of-fit tests: the correlation coefficient (R), normalised mean square error (NMSE), fractional bias (FB), fractional variance (FV) and the fraction of predictions within a factor of two (FAC2).

After that, taking into account the results of a Delphi study which helped determine the extent to which integrated healthcare systems could avoid patient decompensation, which was measured as A&E service use and hospitalisations avoided, an integrated healthcare scenario was created. The Delphi study included all relevant stakeholders of the integrated healthcare organisation, that is, it included decision makers, clinicians and epidemiologists, and was based on a literature review. This allowed us build the budget impact analysis.

5.2.2 Evaluating the intervention

After validation, the model needs to be deployed. First, we carried out a statistical analysis. The standard approach in assessing the difference in resource use between the intervention and control groups was to compare the rate of number of contacts for each patient. For each service, the rate was calculated as the number of contacts or events divided by the patient's follow-up time. The database unit was the contact that we transformed into rates of events by patient-time.

The statistical analysis was performed in four steps. First, a descriptive approach with univariate statistics allowed us to see if there were socio-demographic and clinical differences by group (type of organisational model). Second, we studied the resource consumption rates by group. To carry out these univariate analyses, we could not apply the standard approach (mean comparison or test of location of the distribution by the Mann–Whitney U test) because of the lack of normality in rate distributions and substantial point probability mass at zero. Alternatively, we categorised the rates in five groups (0 events, 1 event, 2 events, 3 events, ≥4 events) to apply a chi-square test for statistical differences between groups. The third step consisted of the univariate evaluation of the costs for primary and hospital care by group (type of organisational model). The procedure was the Mann–Whitney U test, that is, a test of location of the distribution. The fourth and final step addressed the multivariate analysis.

As costs and rates do not usually adjust to a normal distribution, linear regression models based on ordinary least squares (OLS) cannot often be used. When OLS do not fit, general linear models (GLM) offer a solution. Thus, multivariate analysis with GLMs was performed with total cost and cost for primary care and hospital care as dependent variables, group (intervention or control) as an independent variable, and socio-demographic and clinical data (age, comorbidity index, etc.) as covariables.

[13] WHO Software tools http://www.who.int/healthinfo/global_burden_disease/tools_software/en/. Accessed Jun 28, 2014

Alternatively, we used Cox regression with repeated events to evaluate by group the risk of hospitalisations and emergency room visits. This method assesses the time until event taking into account that the same patient can have the event of interest (resource contact) more than once. The advantage with this method is that we can take into account the scheduled time of the patient's use of services, but rates do not distinguish between the dispersion and concentration of contacts. This multivariate procedure supplies a hazard ratio comparing both groups (intervention and comparator) also adjusted by covariables.

Additionally, the real costs together with the objective cost set in the plan stage determined whether the trend was positive or not. That is, we included the following real costs of multi-morbid patients in the organisation in the Budget Impact Analysis so that we could see how far this was from the predicted traditional and integrated health care.

5.3 Prototype: Donostialdea County (Basque Country)

In the following section we show the results obtained in the Donostialdea County (Basque Country) as an example of what we will get for the whole Basque Country and Veneto analysis.

5.3.1 Conceptual model

A discrete event simulation (DES) model was built using the Arena Rockwell software v14 to represent the care pathway for multi-morbid patients, which was characterised by frequent transitions to decompensation states over time. For this study, the natural history of multi-morbid patients was divided into two stages (stable and unstable). During the stable state in which the patients stayed at home, they were cared for by primary care professionals. Contacts could be of a diverse nature, as patients could be cared for by GPs and nurses either at the healthcare centre, at home, or by telephone. When patients decompensated and required additional attention, they were referred to secondary care, which included A&E services, hospitalisation or home hospitalisation (Figure 13).

This conceptual model will remain the same for the whole Basque Country assessment, but will of course be tailored for the Veneto region.

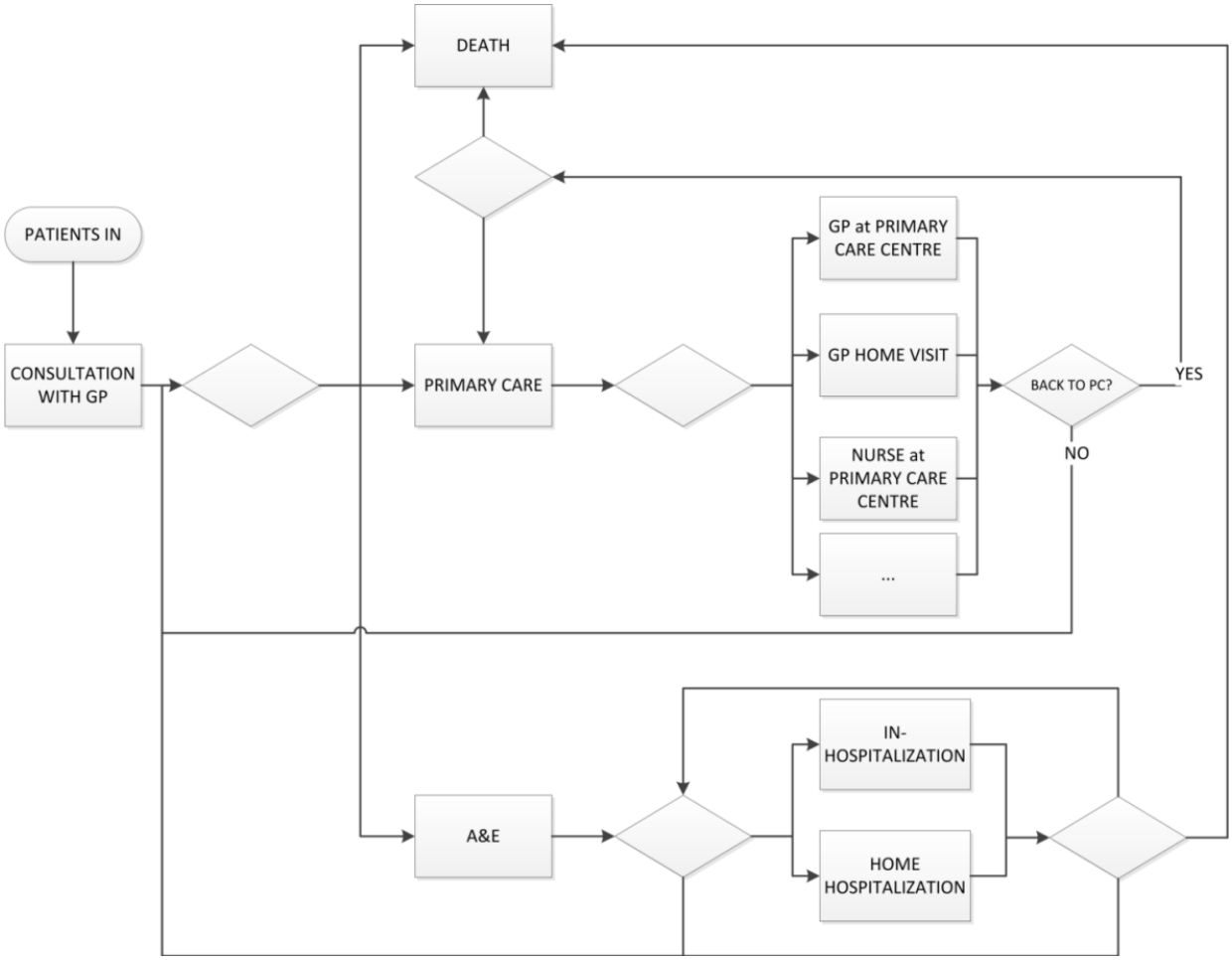

Figure 13: Conceptual model of the simulation model

5.3.2 Results

By considering the ageing of the general population, the multi-morbid-patient population in this area will increase by 8% by 2020. In addition, as the target population is not only larger but older, the expenses will increase by 21% under conventional healthcare. However, if interventions were successful and reduced emergencies by an annual 2%, this budget would decrease by 18%, with cumulative savings of more than half a million euros in the study period (Figure 14).

5.3.2.1 Model validation results

In the following table we see the validation results.

Table 19: Validation results

	Criteria	PC	A&E	Hospitalisation
Correlation coefficient (R)	(> 0,8)	0,85	0,84	0,87
Normalized mean squared error (NMSE)	(< 0,5)	0,00	0,01	0,00
Fractional bias (FB)	[-0,5, 0,5]	0,00	0,03	-0,01
Fractional variance (FV)	[-0,5, 0,5]	0,32	0,29	0,04
Factor of two	(> 80,00)	1,00	1,00	1,00

5.3.2.2 Research results

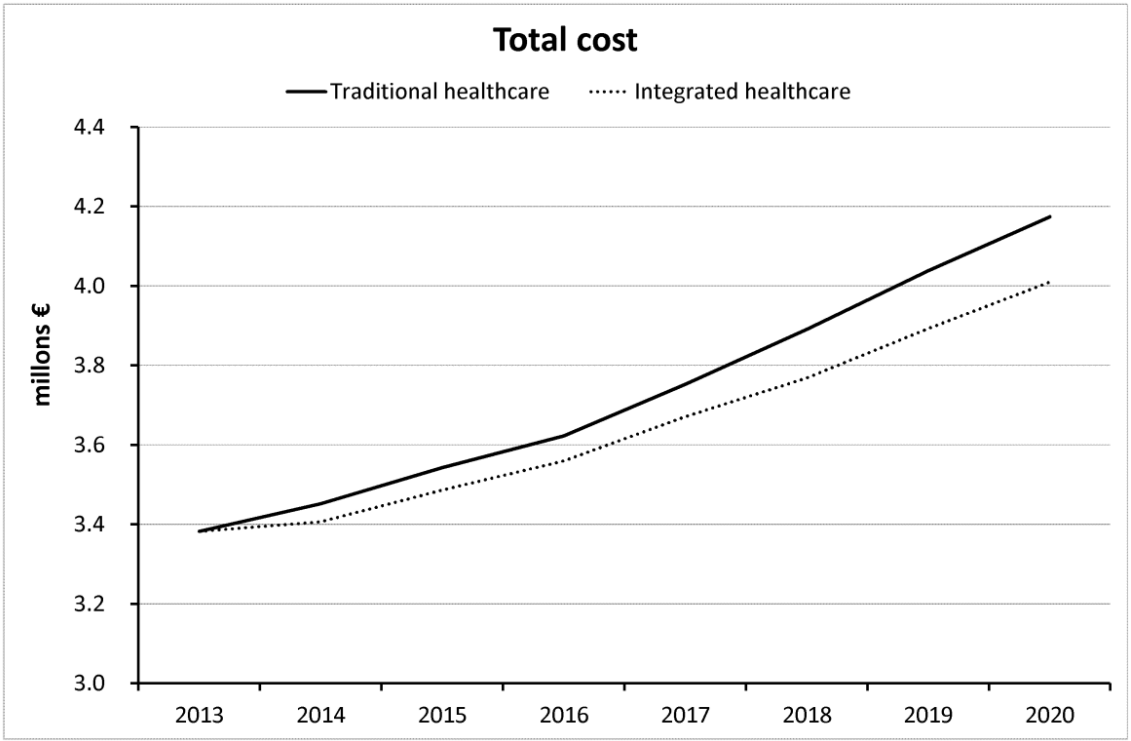

Figure 14: Budget Impact Analysis. Plan stage

The results were based on the records of two years' resource consumption for both the intervention and control groups. Table 20 shows the descriptive analysis of the two groups. There were statistically significant differences in the mean age of the groups at the beginning of the follow-up.

Table 20: Descriptive analysis of demographic and ACG weight score

		2011		2014		p-value*
		N	%	N	%	
		1113	100%	1428	100%	
Sex	Men	661	59,4%	835	58,5%	0,34
	Women	452	40,6%	593	41,5%	
Age	<80	684	61,5%	778	54,5%	0,00
	>=80	429	38,5%	650	45,5%	
ACG weight score	<7,35	445	40,0%	631	44,2%	0,02
	>=7,35	668	60,0%	797	55,8%	
		Mean	**Standard deviation**	**Mean**	**Standard deviation**	**p-value****
Age		75,34	10,30	76,40	11,01	0,01
ACG Weight score		7,75	1,04	7,68	1,05	0,09

The 2014 group was statistically older. The resource consumption by group expressed by categories and means appears in Table 211 with the univariate analysis. With some use of primary care resources, distributions were different, but no statistically significant differences appeared in hospital emergency visits and hospitalisations. As two thirds of the patients did not receive any contact at home from a primary care nurse, we noted that the deployment of the integrated model is still an ongoing project in this population.

However, half of the patients in both samples were hospitalised during this two-year period. The level of use of emergency rooms was still higher, as only one out of four patients did not use them at all.

Table 21: Annual rates of contact of different resource consumption (univariate analysis)

	2011	2014	p-value
General practitioner (Health Centre)			
0	14 (1,3%)	38 (2,7%)	0,00
1-5	189 (17%)	289 (20,2%)	
6-10	383 (34,4%)	506 (35,4%)	
11-20	401 (36,0%)	495 (34,7%)	
>20	126 (11,3%)	100 (7%)	
General practitioner (home)			
0	810 (72,8%)	1009 (70,7%)	0,23
1-5	275 (24,7%)	362 (25,4%)	
6-10	24 (2,2%)	44 (3,1%)	
11-20	4 (0,4%)	12 (0,8%)	
>20	0 (0%)	1 (0,1%)	
General practitioner (telephone)			
0	605 (54,4%)	597 (41,8%)	0,00
1-5	456 (41%)	685 (48%)	
6-10	35 (3,1,0%)	109 (7,6%)	
11-20	15 (1,3%)	34 (2,4%)	
>20	2 (0,2%)	3 (0,2%)	
Primary care nurse (Health Centre)			
0	118 (10,6%)	300 (21%)	0,00
1-5	532 (47,8%)	781 (54,7%)	
6-10	327 (29,4%)	249 (17,4%)	
11-20	116 (10,4%)	79 (5,5%)	
>20	20 (1,8%)	19 (1,3%)	
Primary care nurse (home)			
0	739 (66,4%)	915 (64,1%)	0,28
1-5	229 (20,6%)	303 (21,2%)	
6-10	49 (4,4,0%)	91 (6,4%)	
11-20	55 (4,9%)	69 (4,8%)	
>20	41 (3,7%)	50 (3,5%)	

	2011	2014	p-value
Primary care nurse (telephone)			
0	799 (71,8%)	908 (63,6%)	0,00
1-5	298 (26,8%)	478 (33,5%)	
6-10	16 (1,4%)	33 (2,3%)	
11-20	0 (0,0%)	9 (0,6%)	
>20	0 (0%)	0 (0%)	
Primary care emergency			
0	877 (78,8%)	1142 (80,0%)	0,33
1-5	229 (20,6%)	274 (19,2%)	
6-10	3 (0,3%)	10 (0,7%)	
11-20	3 (0,3%)	1 (0,1%)	
>20	1 (0,1%)	1 (0,1%)	
Emergency			
0	306 (27,49%)	405 (28,36%)	0,35
1-5	796 (71,52%)	1005 (70,38%)	
6-10	8 (0,72%)	17 (1,19%)	
11-20	0 (0%)	0 (0%)	
>20	3 (0,27,0%)	1 (0,07,0%)	
Hospitalisation			
0	584 (52,47%)	700 (49,02%)	0,21
1-5	527 (47,35%)	724 (50,7%)	
6-10	2 (0,18%)	4 (0,28%)	
11-20	1113 (100%)	1428 (100%)	
>20	0 (0,0%)	0 (0,0%)	
Home hospitalisation			
0	1074 (96,5%)	1412 (98,88%)	0,00
1-5	38 (3,41%)	16 (1,12%)	
6-10	0 (0%)	0 (0%)	
11-20	1 (0,09%)	0 (0%)	
>20	0 (0,0%)	0 (0,0%)	

When the resource use was aggregated with the cost as unit to weight, the only statistical differences were found in the cost of primary care and nurse care. The level of use of nurse care was higher before the implementation of the integrated model (Table 22).

Table 22: Annual cost comparison of primary and hospital care (univariate analysis)

Costs	2011		2014		p-value*
	Mean	Median	Mean	Median	
General Practitioner	370,62	326,16	355,02	319,38	0,21
Primary Care Nurse	135,59	83,72	123,41	65,78	0,00
Primary Care costs	519,95	446,57	491,97	433,12	0,02
Emergency costs	102,44	66,27	98,91	66,27	0,62
Hospitalisation	2.038,78	1.136,86	2.198,08	2.273,71	0,06
Home hospitalisation	159,59	0,00	104,21	0,00	0,59
Total	2.820,76	2.407,39	2.556,88	2.556,88	0,35

The multivariate analysis in Table 23 allowed assessment of the impact of the organisational model taking into account the adjustment by covariables as weight score, age and sex. The 2011 sample showed lower costs in hospitalisation and higher costs in primary care and emergency room visits. However, the total cost did not present statistically significant differences. As the coefficients in the GLM appear in a log scale, we translated them to costs according to the organisational model for two different combinations of covariables. As previously noted, these differences were not statistically significant. The Cox regression showed a statistically significant hazard ratio of 1.19 in hospital admissions for the intervention group.

Table 23: Annual costs comparison of primary and hospital care (multivariate analysis with generalised linear models)

Parameter	B	Standard error	p
Total Cost			
Intercept	8,20	0,03	0,00
Stratification 2011	-0,03	0,03	0,28
Age <80	-0,10	0,03	0,00
Weight score <7,35	-0,27	0,03	0,00
Male	-0,11	0,03	0,00
Primary care cost			
Intercept	6,45	0,03	0,00
Stratification 2011	0,05	0,02	0,02
Age <80	-0,15	0,02	0,00
WS <7,35	-0,18	0,02	0,00
Male	-0,16	0,02	0,00
Emergency cost			
Intercept	4,73	0,03	0,00
Stratification 2011	0,02	0,03	0,46
Age <80	0,04	0,03	0,12
Weight score <7,35	-0,24	0,03	0,00
Male	0,00	0,03	0,99

Parameter	B	Standard error	p
Hospital total cost			
Intercept	7,96	0,04	0,00
Stratification 2011	-0,06	0,04	0,08
Age <80	-0,08	0,04	0,04
Weight score <7,35	-0,24	0,04	0,00
Male	-0,08	0,04	0,03
In-hospitalisation cost			
Intercept	7,96	0,03	0,00
Stratification 2011	-0,06	0,03	0,02
Age <80	-0,02	0,03	0,50
Weight score <7,35	-0,22	0,03	0,00
Male	-0,04	0,03	0,10

Putting together the results of the statistical analysis that show no change in the resource consumption and costs by 2014 and the BIA provided new insights about the implementation of the integrated intervention. In Figure 15 we included the 2014 evaluation in the BIA for Donostialdea County, and drew how the points representing the following years (2015, 2016, etc.) could hypothetically evolve in future. As the points did not move closer to the objective line, we could state that deployment and/or intervention must be re-considered. Then, if the implementation is deemed unsatisfactory, the necessary action should be carried out to begin the planning process again.

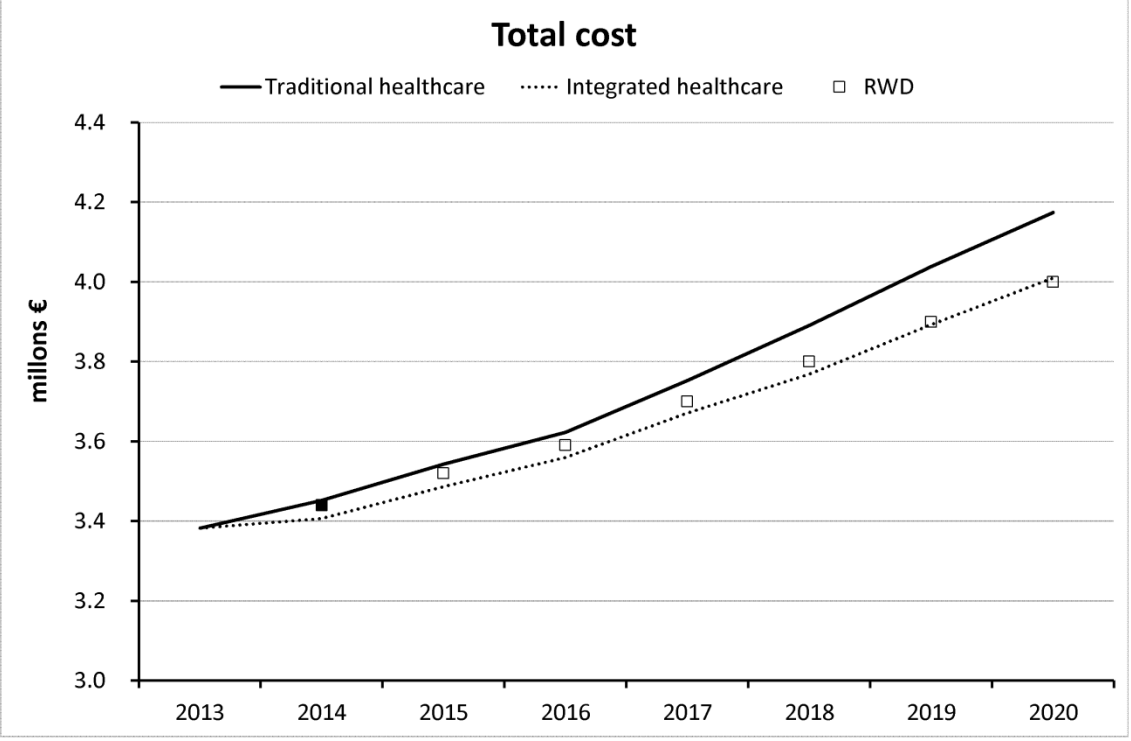

Figure 15: Budget Impact Analysis. Check stage including real-world data (RWD) for 2014 and hypothetical costs for the following years

5.3.3 Conclusions

Deming's PDCA cycle, together with statistical analysis, is a well-known tool for management, but to our knowledge this work introduces for the first time the BIA within

the PDCA cycle for continuous improvement for integrated healthcare models. Representing the care process and natural history of multi-morbid patients with DES allowed to forecast the economic burden associated with that population in Donostialdea County.

This was possible by the use of data and tools with very different origins. We combined clinical evolution, resource consumption, demographic trends, epidemiological data obtained with the Dismod II software, parametric survival analysis, economic evaluation, and simulation to carry out a BIA to inform the planning stage of the Deming's cycle. This application of modelling was also considered in the report addressed to United States' President Barack Obama in May 2014 by an expert task force that highlighted the uses of such engineering tools to improve management of health systems integrating simulation modelling and statistical analysis within the Deming's PDCA[14] cycle has helped the continuous improvement of implementation of complex interventions within integrated healthcare organisations[15].

The four stages described in the PDCA cycle mirror the scientific experimental method of formulating a BIA, collecting data to test the hypothesis, analysing and interpreting the results, and making inferences to iterate the hypothesis[16].

We used simulation modelling to formulate the hypothesis (planning) by defining two key elements derived from extrapolation of resource consumption to 2020: foreseeing the situation and setting objectives. First, modelling anticipated the increase of care cost for multi-morbid patients due to ageing in Donostialdea County. Second, it showed the cost savings if the programme achieved the objective of reducing unstable conditions in patients by an annual 2%. As this was quantified in cumulative savings of more than half a million euros, decision-makers would be able to assess in advance the size of the change they could expect from the deployment of the integrated programme in terms of BIA, as shown in the example of Donostialdea County.

We aimed to replicate the integrated healthcare by a functioning or interactive representation of the system, as opposed to purely conceptual models such as mathematical functions. DES was especially useful because it allowed to handle time between events (primary care consultations, contacts with the A&E department, hospitalisations) stochastically[17]. Moreover, it included time explicitly, making it possible to reproduce reduction of emergencies on a gradual basis.

Implementation time is important in such complex interventions, especially when the intervention is subject to a learning curve. The statistical analysis suggested that the programme did not work in Donostialdea County. However, final conclusions about the intervention could not be drawn, as economic evaluations based only on early appraisals can be misleading[18] if they do not take into account the resistance to change. Unlike in

[14] Executive Office of the President. President's Council of Advisors on Science and Technology. Report to the President. Better health care and lower costs: Accelarating improvement through systems engineering. Available from: https://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/pcast_systems_engineering_in_healthcare_-_may_2014.pdf. [Accessed Sept 10, 2015]

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

[16] Speroff T, O'Connor GT. Study designs for PDSA quality improvement research. Qual Manag Health Care. 2004;13:17-32

[17] Strandberg-Larsen M,Krasnik A. Measurement of integrated healthcare delivery: a systematic review of methods and future research directions. Int J Integr Care. 2009;9

[18] Drummond M,Griffin A,Tarricone R. Economic evaluation for devices and drugs--same or different? Value Health.2009;12:402-4

pharmaco-economic studies, efficiency cannot be separated from efficacy of the intervention[19].

This implementation issue should be raised when assessing the impact of the intervention. If the statistical intervention is carried out early in time, we risk stating that the intervention has barely been effective and discontinue it. An early assessment may show no statistically significant results, but may be accompanied by a positive trend that could be consolidated over time.

The Donostialdea County health service has adopted over a period of years a functional structure, built around a discipline-based specialisation in which, as Mintzberg pointed out, professional bureaucracies have been assumed [20] In order to be functional, professional bureaucracies require a stable work environment and organisational climate, so that skills and procedures can be standardised. This results in a phenomenon known as 'labour socialisation', which implies that any member who joins the organisation must learn the scale of values, norms, and standards required for integration, causing great difficulties in incorporating innovations[21,22,23].

Drummond [24] suggests taking an interactive approach to the clinical and economic evaluation of complex interventions by revising the expected results as increasing evidence of effectiveness in actual use is collected. Our approach is consistent with these suggestions, and apart from the statistical approach necessary to determine whether the deployed intervention has changed the resource consumption, the BIA performed when the intervention was planned gave us a broader perspective in assessing whether we are on course.

Comparing the real resource consumption with the expected values over time allowed us to compare the deviation between the goals determined by the BIA and events currently occurring at each of the stages. If the results begin to agree with the objective over time, it will suggest that work is progressing in the right direction. Otherwise, as in this case, the deployment and/or the intervention should be re-considered. If on the contrary the primary statistical analysis had shown positive results, a new BIA would have to be calculated comparing the conventional and integrated healthcare.

The framework developed within the CareWell project will allow its pilot sites to evaluate the implementation of interventions aimed at maintaining long-term stability of multi-morbid patients. Setting objectives based on evidence and including them in the BIA allows managers to evaluate if the integrated healthcare is actually having the expected impact. However, this approach has a broad scope and cannot be limited to the management of integrated healthcare interventions focused on improving multi-morbid patients' care. In fact, it could be used for any complex intervention in which time and implementation are key issues in order to determine the adequacy of the implementation.

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5.4 Application of the framework to the multi-morbid population of Basque Country and Veneto

The developed framework is currently being applied to the whole Basque and Veneto population. This step is possible because both regional health systems have developed a unified information system that allows to obtain data from big databases.

CareWell criteria applied to the Basque population resulted in 8.503, 8.484 and 9.302 patients for 2012, 2014 and 2015 respectively. We are currently exploiting the databases to obtain the mathematical functions.

We are currently defining the target population in Veneto.

We are going to collect the following data for each region:

- Population by gender and age from basal scenario to 2020 by gender and age. If available data is defined by age groups, the distribution of age in those groups needs to be defined.
- Population mortality rates for each region.
- Resource consumption of multi-morbid patients.

We want a follow up of two years for the patients identified on 1st January of the basal year to build up the mathematical functions. Follow up period will start at the 1st January of the basal year and will finish the 31st December of the next year.

We will define two tables; the first one will include all the socio-demographic data such as healthcare area, age, gender, if the patient died and if so the date of death. The second one will include all the resources consumed and when. Resource type will include all the resources considered in the local pathway such GP home consultations, primary care nurse home consultations, A&E consultations, hospitalisations, country hospitalisations, nursing homes, etc.

Origin of hospital contact. It may happen that primary care doctors talk directly with the hospital and initiate a hospitalisation; this will allow us identify this kind of situations.

Discharge destiny refers to the circumstance of the patient at the discharge point: did he die during hospitalisation, was he/she referred to a country hospital, nursing home, etc.? Or on the contrary, was he/she send home?

Identification number	Health care area	Age	Gender	Other socio-demographic variables you want to consider	Death (Yes/No)	Date of death

Identification number	Resource type	Date when resource consumption occurred	Length of hospitalisation	*Origin of hospital contact (plan/unplanned) ONLY IF DATA AVAILABLE*	Discharge destiny

6. Conclusions

This interim report presents the first steps of the CareWell project. The MAST evaluation model has been taken as the framework for the comprehensive evaluation of this project.

The first part of the report sets out the need for development and assessment of new models of integrated care targeting chronic complex patients. The pattern of diseases presented by these patients and the complexity of the health and social and familial needs created by them cannot be properly addressed from the classical clinical perspective in which it is the subject who demands a specific service and the care system provides it.

In order to provide adequate services to chronic multi-morbid patients, the care system need to do more and do it differently. The six pilot sites present, in the second part of this report, their integrated care proposals, explaining the main components and the key elements necessary for their implementation.

In order to validate the new integrated care coordination pathways for patients with multiple comorbidities, the professionals' perspectives of the implementation processes has been collected and analysed, covering: communication between healthcare professionals; definition of care manager role; information sharing between healthcare professionals via central storage of data; definition of shared care plans and smooth transition support by facilitating information sharing after hospital discharge using ICT; patient empowerment and home support pathway; promotion of patient and caregiver empowerment through access to health related educational material; patients' access to clinical information and booking appointments via distinct ICT tools; messaging between healthcare professionals and patients / caregivers via Personal Health Folder; and remote monitoring of patients' health status via telemonitoring.

The last evaluation domain covered in this report is directed at the assessment of the impact of the programme implementation. First, recruitment flow charts for each pilot each are presented, together with a first baseline analysis, although problems with the uploading process have made it impossible to fully evaluate all sites. Patients included meet the proposed target population and could be defined as an aged, multi-morbid population with complex health and social needs. They are satisfied with several aspect of usual care, but express the need to be more participative in the decision making process regarding their care.

To enable an understanding of the barriers and facilitators for implementing ICT-supported integrated care, a qualitative evaluation of the processes related to the implementation of CareWell was carried. Professionals from all the different sites pointed out that after deployment of CareWell the coordination and communication among professional has clearly improved, and so have the work processes and use of the services. Patients are being empowered, but professionals do not feel a change in their role.

A predictive model in the form of Budget Impact Analysis, aiming to replicate integrated healthcare by a functioning or interactive representation of the system, was also developed. This simulation modelling formulated two hypotheses by defining key elements derived from extrapolating resource consumption to 2020, and modelling the anticipated increase of care cost for multi-morbid patients due to ageing. The model is based on the objective of reducing the costs for unstable conditions in patients by an annual 2%. On this basis, the model predicts cumulative savings of more than half a million euros. The objective for the coming year is to identify the actual reduction in costs.

Appendix A: Interviews with professionals

A.1 Basque Country

PROFESSIONAL 1	
1. Please introduce yourself shortly (job & education)?	Degree in nurse and social graduated. I have worked as nurse in primary health care and in hospital. In 2006 I joined as a nurse at the cardiology service at Cruces Hospital and now I am liaison nurse at Cruces Hospital.
2. How long have you worked in your current job?	I am working as liaison nurse since 2011.
3. What is your age?	52 years old
4. Can you describe the care you provide to frail multimorbid patients?	The care model to multimorbid patients has changed. Now the care is more addressed to the patient and caregiver in a global way and not only the disease The patient and caregiver are situated at the centre of the care. It is a slow process that advances gradually.
5. Can you describe the ICT solution that you are using?	I use corporate tools: Global Osabide and Osanaia (nurse tool) I can use the primary care tool (Osabide AP) because I am a liaison nurse and using this tool I can add appointments with primary nurse or practices advance nurses practitioner and create the referral sheet. I use Global clinic to read reports and Osarean to connect to telehealth centre for the patients follow up when they are discharge during the weekend. I use non face to face interconsultations with cardiology, respiratory, home hospitalization, emergency services.
6. Do you think it has supported the integrated care? Please explain.	Yes, before when a patient came to the hospital I couldn´t know anything about the patient, now I can search the care history and follow it up and know why the patient is coming to the hospital. I can draw the care history of patient, have the referral form to the emergency, establish a care plan and share it with the primary care teams and with the patient.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Yes, I can follow up the care to the patient. I can consult to the primary care physician and primary nurse and know the general history of the patient. Yes, I have more communication and I interact more with my peers through interconsultations, I can set a day with the patient to his primary care physician. I can set a day with the telehealth centre for the follow up of the patient when the patient is discharged from hospital. The use of ICT implies more responsibility because I can enter to the patient's history that is confidential information. Patients feel more secure in their care and attention

PROFESSIONAL 1	
	because the health professionals explain them that all the information related to their care is in electronic health record of each patient and both care levels can share and search the information.
8. What changes in the ICT have you seen in the last months?	I didn´t see changes in ICTs, but now some patients knows that they can see the empowerment program in Osasun Eskola (webpage for empowerment) and they can see the appointments with their physicians in their health folder.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	The patient sees that professionals are more coordinated. At discharge a care plan is given to the patient (in hand) and the professionals explain them that the plan is also in electronic format in Global Osabide where their primary care teams can see the plan.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Yes, though as I am in the hospital I have not seen not seen many patients but when I talk to them I realise that they know more about their disease.
11. What have been the benefits and the pitfalls seen from your perspective?	Benefits: patient empowerment, patients understand more their disease and their symptoms and know what to do when they have a decompensation. Pitfalls: There are several programs in the organization (CareWell , telepoc ...) that fall on the same professionals and patients which can confuse.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	I have experienced little change at hospital level. Now, there is more there is more communication between primary care and hospital. This improvement in communication began with the presentation of the program in the three integrated health service organizations. As I am liaison nurse I have a lot of contact with the telehealth centre.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	I use non face to face consultation with my colleagues in the hospital, with primary care and telehealth services I use agenda of Osabide program.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	Very good, it's a safe and confidential way to know everything about the patient. Moreover, you can establish a care plan and all professionals and the patient can be aware of it.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	As I am a liaison nurse I has access to all system tools. The implementation process for Osanaia (the tool for nurse) was quick (4-6 months). However it would be good and useful to have a single tool with all the information of the patient and not differentiate between hospital (Osabide Global), primary care

PROFESSIONAL 1	
	(Osabide AP)and nurse (Osanaia). We have implemented other useful tools for communication between professionals as Osagune where you can share protocols and reports. The implementation of videoconference tool should be faster because they can be very useful.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	It would be necessary to inform citizens and patients of different tools that are available: Health Folder, Osasun eskola… .

PROFESSIONAL 2	
1. Please introduce yourself shortly (job & education)?	Bachelor of Medicine and Surgery. PhD. Medicine. Specialist in Internal Medicine. Working as internist since 1981(except one year and a half working in the emergency room). She works in the Cruces hospital since 1991.
2. How long have you worked in your current job?	Six years working as head of the internal medicine survive of the hospital
3. What is your age?	61 years old
4. Can you describe the care you provide to frail multimorbid patients?	The care to multimorbid patients has changed and improved in recent years, especially because primary care doctors have more integrated into their daily activity the care to multimorbid and chronic patients and the need of the care follow up and the care plan to these patients. However, it is a slow transformation.
5. Can you describe the ICT solution that you are using?	As professional working in hospital I have access to Osabide Global to check the medical history of the patient. I have access to Presbide where I can find information related to drugs prescription I use non-face to face interconsultations with primary care. I also use email and phone to coordinate and communicate to primary care physicians and advance practice nurse from primary care and liaison nurses from hospital.
6. Do you think it has supported the integrated care? Please explain.	Yes, the use of ICTs is helpful because it allows sharing information among professionals. Previously we had no support and now we have a common point among professionals.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The workflow is changing because the use of ICT allows to access to any information of the patient. Using presbide, which is the tool for drug treatment allows know what drugs has been prescribed to each patient. Using the ICT I can interact more with primary care professionals via email and not face to face interconsultations. The use of ICT entails greater responsibility.

PROFESSIONAL 2	
	Patients can make more decisions on their care because they can learn more about his illness.
8. What changes in the ICT have you seen in the last months?	I have not seen changes in the last months
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	I don´t use the ICT to communicate with the patient, but it helps me to have a better understand about its care history and previous treatments.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	The program has help us to organize and improve the coordination between health care levels but is a program that the central base is in primary care.
11. What have been the benefits and the pitfalls seen from your perspective?	Benefits: change in the form of assistance to multimorbid patients improving the patient monitoring at home and detect early decompensation. Patient education and caregiver. Pitfalls: as a research project uses additional resources and when the project ends is difficult to know whether they can keep.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	Yes, I have experienced that the program has facilitated the communication among professionals. We have shared experiences, ideas and learn about others' experiences when we have defined the care pathway.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	I use e-mail and telephone to communicate with hospital professionals and non face to face interconsultations to communicate with primary care.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	The use of ICTs helps in the coordination and communication between professionals. Moreover, all professionals have access to the patient's care plan.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	In my opinion, the implementation of ICT has been slow, with poor and unordered information. When a changes is done in the electronic health record we don´t receive enough information. The communication strategy should improve.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	I think that if we want to use ICT a better communication strategy should be done for both professionals, patients and citizens aware of the existence of different alternatives.

PROFESSIONAL 3	
1. Please introduce yourself shortly (job & education)?	I have a degree in nursing and I am specialist in occupational health. I have worked at the Post Continuing Care (PAC) for three and a half years and later in mutual doing medical examinations I have worked as nurse in primary care and in the emergency room and in residences. I have worked as nurse in the telehealth centre since 2010.
2. How long have you worked in your current job?	I am the supervisor of telehealth centre since 2011.
3. What is your age?	43 years old. Nurse who are working In the telehealth centre are between 24 years to 63 years although most of them have 28 to 35 years old.
4. Can you describe the care you provide to frail multimorbid patients?	The telehealth care is in charge of the patient when referral service is not available to ensure continuity of care. Currently, the multimorbid patient currently the health profession look after to the multimorbid patients 24 hours a day, seven days a week. In addition, the telehealth centre takes care of the patient when the reference professionals are not available. The model has changed, before each care level worked in subdivision manner. The hospital attended to patients in the acute cases regardless of the chronic diseases. Now both care levels (primary and hospital) work in a more coordinated way, so it is intended that the patient at the hospital and the patient will be treated by the multiple chronic diseases and not only by acute health problem.
5. Can you describe the ICT solution that you are using?	In the telehealth centre, the most used tool is the telephone. We have access to Osabide AP (tool for primary care), Osabide Global (where we can view information from hospital) but it is not a easy access . We have access to the special emergency program to share information with fire fighters and policeman to management the healthcare of primary care We use also the CRM which has been developed for the management of patients with multiple pathologies that are in telemonitoring programs (Telepoc and HF) , The use of CRM allows us to the management of the patients alarms.
6. Do you think it has supported the integrated care? Please explain.	The use of ICT tools provides information and information is power. As I work in the telehealth services I cannot see to patients but before talking to them on the phone we can access to their information and we know what they need. The primary care team indicate us the patient needs and we can target the specific problem. If there were ICTs the information depend on what the patients say, which is not always complete and accurate information.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe	At telehealth centre level sometimes there is duplication of work, because they tools are still not integrated. However, between hospital and primary

PROFESSIONAL 3	
how. Has your relation with other professionals changed? If yes, please describe how.	care the workflow has changed through the non face to face consultation for sharing information and solve problems more agile and quick. The use of ICTs optimizes resources and management of the health system and especially the patient management. Phone calls and non face to face consultations allows to reduced the number of visits and displacements. In many cases it is not necessary to move the patient to the specialist, which implies an improvement of service to the professionals who often are not aware that the caregiver has to ask permission, displacement… The ITCs approach to the health professionals, now there are more interaction and communication between primary and hospital. Now the relationship is much more fluid with the telehealth services, more accessible, we have open channels to call the specialist and have the ability to communicate with both primary care physicians and hospital. Yes, more responsibility is delegated, more responsibility to the nurses for monitoring chronic patients especially those patients who are in telemonitoring programs. Nowadays, patients are more involved in their care, but this requires empower and educate patients. In addition, patients who are in telemonitoring programs feel more controlled. Patients take responsibility for their diseases. The patient meet the recommendations (exercise, diet) because they now that they are to be asked if they have followed up these recommendations. Patients become more aware and more careful, because knowledge is power. Professionals have also recovered this part of patient education that we had forgotten, and it is so important.
8. What changes in the ICT have you seen in the last months?	I have not noticed many changes. Applications continue " without speaking " there are some progress but they are very slow. The informatic progress is slow or perhaps is my perception because e I need faster development. The biggest change in recent months has been the communication has been opened between the emergency program (fire-fighters and policeman) and Health care system. The use of ICT helps me in my relationship with the patient because the patients perceive that I know their disease.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	We provide follow up to the patient outside normal hours of primary care services and through follow-up calls when a patient is discharged from hospital during the weekend.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	The integrated program offers many benefits, the patient is well controlled, they are empowered, all professionals involved in the care are coordinated , the workflow is more agile, the number of visits to hospital

PROFESSIONAL 3	
	and specialists are reduced because sometimes they went to the hospital for decompensation and now the patients know what to do or where to call. The benefit is not only an economic benefit for the organization but also for the patient and their families. The program gives patients and their families comfort and security. The area for improvement would be to change the excessive paternalism that exists in the organization.
11. What have been the benefits and the pitfalls seen from your perspective?	We have experienced many changes. The communication with advanced practice nurses is direct and fast. When the communication is with primary care nurse (for organizations that do no have advanced practice nurse) is somewhat slower Communication with hospital nurses and liaison nurse is quick and we are cited on the agenda when a patient is discharged from the hospital at the weekend.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	Primary and hospital nurse can tell us by phone or schedule us to monitor to the patient. In addition we are also cited from emergency room and home hospitalization. Through CRM we can also be communicated to other professionals
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	The ICTs that are currently available are separate as islands and few bridges connecting islands. However, work is in progress for the integration of all tools but is a slow process.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	The implementation of ICTs is a slow process; the integration of different tools is a slow process.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	To ensure that professionals and patients use the tools these should be easy to use, simple and they have to allow direct communication between the patient and the healthcare professional.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 4	
1. Please introduce yourself shortly (job & education)?	Degree in nursing and physiotherapy. I have worked as primary nurse in Osakidetza and Osasun Bidea (Navarra Health Service) during 15 years
2. How long have you worked in your current job?	Nowadays, I work as data manager in CareWell project since may, 2015
3. What is your age?	36 years old
4. Can you describe the care you provide to frail multimorbid patients?	The care for multimorbid patients has changed. I am agree with the approach of Osakidetza related to the integral and continued care that has to be done to multimorbid patients taking into account the physiological and psychological and social fields.
5. Can you describe the ICT solution that you are using?	As primary care nurse I use Osabide AP. Working as a primary care nurse I have no access to Global Osabide but through AP Osabide I can access to Global Clinic for look to the information of hospital. I also use e-mail and we have just start to use the videoconference using Lync. Furthermore, we are using Osagune which is a interactive channel for professionals where they can share doubts and doubt between professionals working in CareWell Project.
6. Do you think it has supported the integrated care? Please explain.	Yes, I can see the whole evolution of the patient.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Yes, before using ICT everything was on paper and a lot of information was not understood and stories were lost. Now with the use of Osabide AP you can see the most frequent and important episodes, pending proceedings, allergies…You can make queries through the non face to face consultations. The use of ICT provides a lot of information. My communication with other professionals is usually a verbal communication, but if you can check the information from other professionals. Patients find it hard to use IC
8. What changes in the ICT have you seen in the last months?	Yes, we are starting to use the videoconference through the use of Lync and Osagune as a collaborative space between professionals.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Yes, It helps me because they see that I know their history and both the professionals and the patients feel safer.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Yes, the patients recruitment has been difficult but now patients are happy. However, the close monitoring that is being done to the patients has increased the workload of professionals
11. What have been the benefits and the pitfalls seen from your perspective?	Benefits: better follow up of the patient, total assessment to the patient and the patient empowerment program. Disadvantages: A lot of work for the nurses.
12. Have you experienced any changes in the communication between different parts of your	I have not experience changes in the communication. However the coordination between primary care and hospital has to improve because sometimes there is

PROFESSIONAL 4	
organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	not coordination when a patient is discharged from hospital.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	Especially using non face to face consultations and email. Nowadays we cannot share information with social workers through ICTs
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	It is also very useful and necessary if we want to be coordinate and get a care plan for each patient
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	We are informed and we are encouraged to use the new tools. In recent months we have started to use Lync for videoconference.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	I think that ICTs are essential for patient education. The use of the ICTs allows to t the patient to see how the patient is. ICTs are very useful for knowledge the evolution of the patient and to make the care plan for the patient and for the patient education.

PROFESSIONAL 5	
1. Please introduce yourself shortly (job & education)?	Bachelor of Medicine, specialist in family medicine. 35 years as primary care physician in Osakidetza. Head of unit of primary care services in the Andoain health centre and head of the Clinical Management Unit of OSI Tolosaldea .
2. How long have you worked in your current job?	15 months
3. What is your age?	62 years old
4. Can you describe the care you provide to frail multimorbid patients?	The model has changed a lot and the home care and patient empowerment have improved a lot. The integration and coordination between care levels has improved and the new roles of nursing allows a better care of multimorbid patients.
5. Can you describe the ICT solution that you are using?	I use Osabide AP that it is the tool for primary care level and presbide that is the tool for drug prescription.
6. Do you think it has supported the integrated care? Please explain.	The use of ICTs helps a lot, I have all the information of each patients and the information is ordered, so that I can consult at any time easily the information. I have the chance to see the information added other professionals in the electronic health record.

PROFESSIONAL 5	
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The workflow changed a lot when the tools were introduced in Osakidetza but that was sometime age (15 years). The biggest changes in the last year have been the patient empowerment, the integration of care levels and the changes in the roles of nursing. The use of ICT allows me to interact with professionals, but the use of ICT is a tool. Health professionals share more information through non-face to face consultations and emails and it is easier to access to information. I think patients do not use ICTs to make decisions on their care. ICTs tools are complicated to use. In my opinion the professionals should inform to patients of the possibilities of using the different ICTs as the health folder
8. What changes in the ICT have you seen in the last months?	Yes, the tool for drug prescription (Presbide) has changed a lot.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	The use of ICTs allows to see quickly the entire patient information, you can search analytics and you can do consultation to specialists. Also you can receive notifications and take preventive measures with the patients. In presbide (tool for drug prescription) you can find all the pharmacy information when prescribing and have all the information interaction. In addition you can find guidelines for some pathologies and you can see what are the questions that you should ask to the patient according to its pathology.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Yes, In my organization a lot of work has been done and the recruitment has been difficult. Now, that all the patients are recruited the benefits of the patient empowerment start.
11. What have been the benefits and the pitfalls seen from your perspective?	CareWell allowed systematize multimorbidity patient care , and improved communication with the hospital (in our case it is a private hospital) empowerment program designed CareWell is very good and can be very helpful to the patient. However there are many scales to pass the patient should be simplified for daily activity when the project is completed.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	The coordination and communication between primary care and hospital has improved.

PROFESSIONAL 5	
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	I use non face to face consultations with specialists belonging to the Donosti Hospital. As our hospital (Clínica Asuncion) is a private hospital I can not use Osabide because they don´t have in the hospital With our specialist hospital but I use phone.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	The ICT are useful and needed.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	It was a well-connected process, and when changes are made they are communicated via email. When the change is very important, some training sessions are organized.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	If we want that patients and caregivers use the ICTs they should be easy to use similar to the empowerment program development in CareWell project.

PROFESSIONAL 6	
1. Please introduce yourself shortly (job & education)?	Degree in nursing. I have worked for 17 years in hospital (surgical and emergency services) and 7 years as primary care nurse. Nowadays, working as Advanced Practice Nurse in a primary care centre.
2. How long have you worked in your current job?	Three years
3. What is your age?	42 years old
4. Can you describe the care you provide to frail multimorbid patients?	The care model provide to the frail patients has changed a lot in the last year. The care model was very paternalist and both, patient and caregiver, were passive agents. Now the patient and the caregiver are more active. The professionals engage them in self-management and self-care. The patient and the caregiver are in the centre of the model.
5. Can you describe the ICT solution that you are using?	I used Osabide AP which is the primary care tool where I can find all the information of the patient and I also use Global Clinic to coordinate with the hospital. Moreover, I use not face to face interconsultations to communicate with other professionals of the different health care levels.
6. Do you think it has supported the integrated care? Please explain.	Yes, the use of ICT helps to have a global vision of the patient and allows to have a continued patient care.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes,	Now the workflow is more fluid, before you could only know a fraction of the patient care now you can have a global vision of the patient in the different care levels and you can know what happen to the patient in all the health system. However it is need the integration of the social part but I know that is

PROFESSIONAL 6	
please describe how.	working on this. Yes, my relation with other professionals has changed, before the telephone was basic, now I can do not face to face interconsultations and I can also have non face to face communication with the patient by phone or through health folder .
8. What changes in the ICT have you seen in the last months?	I have not seen changed but ICT are being used more and professionals are more aware about to use them and the utility of the ICTs.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	If it allows me to see the complete care history and have a global vision of the patient.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	The integrate care program has had impact on the daily work with the patients. At the beginning of the deployment, the nurses have had much resistance to change but now they realize that when the patient is empowered they use the health services in a more appropriate way. Patients are delighted because they see that there is not fragmentation between the different health care levels. Now, patients know better their disease better and the feel safer because they know what to do when they have symptoms.
11. What have been the benefits and the pitfalls seen from your perspective?	The final benefit is the good use of health resources, good coordination and communication between different levels. However, the integrated care program has supposed a change and at the begging all change supposed a lot of effort. The recruitment of patients and training to professionals have been the hardest.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	Yes, the communication and coordination between internal medicine at hospital level and primary hospital has improved. However, there is still little communication with social services.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	I use ICT solution daily. I use non face to face interconsultations, email and citation on the agenda to coordinate primary care and hospital when a patient is discharge from the hospital. We are going to start to use an ICT to coordinate with social care in the next months.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	Very good and absolutely necessary

PROFESSIONAL 6	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	When some change is done we are explained and communicated. It has been easy.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	The problem of ICT to achieve an integrated care in multimorbid patients is that this type of patient does not use technological tools. We should use ICTs for prevention and promotion.

PROFESSIONAL 7	
1. Please introduce yourself shortly (job & education)?	I have a degree in nursing. I have worked as nurse in hospital level (respiratory service). I am liaison nurse in Basurto Hospital
2. How long have you worked in your current job?	I am liaison nurse since 2012.
3. What is your age?	58 years old
4. Can you describe the care you provide to frail multimorbid patients?	The care to multimorbid patients becomes more complete because you have a more global view of the patient, you see him as a whole When the patient enters in the hospital we review with them the pathologies that have and if they know their care plan and if they know how to control the symptoms.
5. Can you describe the ICT solution that you are using?	As liaison nurse I have access to Osabide AP (which is the primary care story), Global Osabide (which have access both primary and hospital level) and Osanaia for nursing care and care plans.
6. Do you think it has supported the integrated care? Please explain.	Yes, for example Osanaia that is the nursing tool is comprehensive and on a single screen you can see the whole picture of the patient, every care... It is very simple to use.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The workflow has changed. At first it involves a lot of changes and all changes are complicated, but for example using Presbide for prescription drugs we can avoid many mistakes. However, we spend much time filling in the ICTs tool and recording information perhaps more than seeing the patients. There should be a balance. My relationship with other professionals has not changed. I communicate orally with hospital nurses and I communicate through Osabide AP or phone with primary care nurses.
8. What changes in the ICT have you seen in the last months?	I have not seen big changes or new applications only small modifications and adaptations.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	ICTs help me to get information about the patient.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	No by the moment, we have not received any admission. Moreover, The mail role of CareWell project is in primary care level.

PROFESSIONAL 7	
11. What have been the benefits and the pitfalls seen from your perspective?	The benefit of an integrated program is to have the patient as the central axis, plus the program's objectives: avoid incomes, empower the patient and keep the patient at home are consistent with the practice that was done in the hospital earlier ..
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	Communication between primary and hospital level has improved a lot, is very fluid and is bidirectional.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	I use Osabide AP to quote primary care nurses. I communicate orally with hospital nurses. If a social need is detected, the nurse informs the doctor who communicate it to the social worker. If the social need is maintained at hospital discharge it is communicated to the primary care team.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	It is very good and useful. With the nursing tool, Osanaia, we can see all information on care plans from primary and hospital level
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	It was complicated,, the changes have supposed to learn, but now the ICT are very helpful
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	I have not suggestions

PROFESSIONAL 8	
1. Please introduce yourself shortly (job & education)?	Degree in Medicine, an internist medicine. I have worked in Osakidetza since June 2008, also in IMQ. I have also participated in various research studies concerning pluripathologic patients, anticoagulation, ... I am currently in charge of Internal Medicine Hospital of Santa Marina.
2. How long have you worked in your current job?	Since 2012
3. What is your age?	57 years
4. Can you describe the care you provide to frail multimorbid patients?	Has always tried that there is a comprehensive care for multimorbid patients, and I keep trying to improve it, we use to have meetings as Comarca Bilbao, OSI Bilbao now, coordination meetings. Yes, the model has changed to a more integrated care.

PROFESSIONAL 8	
5. Can you describe the ICT solution that you are using?	The computer is our day to day, we use Osabide Global and Osabide Clinic especially, but also non-face to afce consultations, e-mail, telephone ... They are essential tools in our work.
6. Do you think it has supported the integrated care? Please explain.	Yes, very much, have more contact with other specialists, universal access to electronic medical records for sharing patient information, it is easier to coordinate, non-face to face consultation... All this leads that patients are better cared.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	We used to work alone, individually, each doctor with its own patients to address an acute health problem. Now it is different, it has radically changed the way people work, towards a more integrated and coordinated care. The relationship with the other professionals that did not exist now exists. Before each specialist worked alone, and now the communication is direct and easy, we coordinate with the liaison nurse, with primary care physicians...
8. What changes in the ICT have you seen in the last months?	No... Well, there are small changes, because most are already in place here. Electronic prescribing was implemented a year ago... Actually, from the Hospital we hardly use direct communication with the patients, we do use ICT at hospital level to work with professionals, coordinate with liaison nurse... is (liaison nurse) who has more direct contact with the patient.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Right now there is no direct contact with patients, not from the hospital, but it has had an impact on the way we work, improving what we were already doing, the inclusion criteria, the test ... which also has an impact on the patient because receives better care.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	On the positive side it improves coordination between specialists, but it could improve communication from the hospital with the patient, perhaps through the "patient's folder", for there to be a direct communication of the hospital with the patient and the specialist.
11. What have been the benefits and the pitfalls seen from your perspective?	We already communicated, because some meetings already do, but CareWell communication has further entrenched, it is more fluid and more frequent, more direct. Since 2012 we had to figure liaison nurse, who has been key in strengthening the relationship between hospital and primary care.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and	Among professionals we specifically use Osabide Global and Osabide Clinic, as well as not-face to face consultations for bidirectional inter-consultations. Otherwise, inter-consultations and email.

PROFESSIONAL 8	
nurses? • Others?	
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	It is useful for coordination between hospital specialists; the liaison nurses... it is a very good tool for planning action and organize our work.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	They were implemented some time ago, and have been very well accepted; integrated into the work we do every day.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	From the hospital side, we have little direct contact with the patient, this is a point that could be improved, ICT can be modified improve contact between the patient and the specialist, because communication is already very good among specialists, but among specialist patients and could be improved.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

A.2 Croatia

PROFESSIONAL 1	
1. Please introduce yourself shortly (job & education)?	I'm a specialist of General practice
2. How long have you worked in your current job?	About 25 years
3. What is your age?	I am 52
4. Can you describe the care you provide to frail multimorbid patients?	It is my responsibility to observe them and to make sure that specialists observe them so we can agree on therapy and medications for each patient.
5. Can you describe the ICT solution that you are using?	In addition to Ericsson mobile health within CareWell project we use our ICT solution called MCS.
6. Do you think it has supported the integrated care? Please explain.	Since the beginning of the CareWell pilot a lot of improvement has been made considering observing the patients in regards of taking better care of them.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Well not really. Maybe in a sense of better communication with my field nurse. Regarding responsibility it has pretty much remained the same. Maybe field nurses have slightly more work. Communication has improved because before we had to contact them by phone which was hard sometimes. To get a hold of them and arrange a

PROFESSIONAL 1	
	meeting since they cover a lot of patients in the field. Regarding patients, some have problem with the field nurse coming in their home so they act or have acted suspicious.
8. What changes in the ICT have you seen in the last months?	Well I can monitor them easier.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Not really. It pretty much stayed the same since only a certain number of patients are involved so it doesn't take much of my time.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Benefit is most certainly the fact that we can monitor patients on daily basis. I don't see any negative effects.
11. What have been the benefits and the pitfalls seen from your perspective?	Communication between me and the nurse has really gone up. It is really excellent now.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	We communicate by notes if needed. Nurse can leave me a note regarding some measurements or her worries about something and I can respond to it really quickly.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	It is a very good tool by my opinion.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	Very good.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	Well I think that this project is really going to make a difference.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 2	
1. Please introduce yourself shortly (job & education)?	I am a general practice doctor, but before that I worked on various project concerning technological solutions regarding medicine in the ministry of education.

PROFESSIONAL 2	
2. How long have you worked in your current job?	12-13 years.
3. What is your age?	I am 47.
4. Can you describe the care you provide to frail multimorbid patients?	Well regular contact is the most important thing. Either they come to my office or we communicate by phone; I do medication prescription and control of those medication regarding their current health status; regular follow up visits; if needed sending them to a specialist; taking into regard what the specialist said and so on.
5. Can you describe the ICT solution that you are using?	Besides CareWell at this point MCS and Medicus.
6. Do you think it has supported the integrated care? Please explain.	CareWell has made a lot of progress concerning patient care. I would like to compliment all of us here who are working on it from the beginning. It is a potential link between us and specialist which will, I hope, bring only good things to our patients. It is a great communication system which allows us faster response rate which ultimately can lead to big differences in the quality of life of the patients. It is a huge step forward.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Well my perception of the patient has changed for me. I have quicker access to data of the patient. To the measures that field nurse takes. It makes me quicker to respond if something is not right. It made my job easier concerning patients which are usual not able to come to me on regular basis. Well not yet but they are on their way to do so. Those patients that are in this project feel better, they feel important. They communicate with the field nurse and with us here at the medical office more. It would be great if this project could be applied one day to younger people. Not only chronic patients because that way, by education, and by being able to see their own medical measurements it could lead to a healthier population in general.
8. What changes in the ICT have you seen in the last months?	Since the beginning of the project patients who are involved are much more communicative, they feel honoured to be a part of it and they feel important. Also I feel more at home with them concerning discussing their medical problem that we need to solve. I would like for all patients to be involved in such a solution because I feel the difference in communication between patients in CareWell and my other patients.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	No. My work has stayed the same concerning other patients who are not in the project. It does not take much of my time.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Very fast and efficient way to access patient data collected on the field. Also taking measurements from the patients which are not usually so easy to get – for example they have to wait too long to get it

PROFESSIONAL 2	
	in hospital… for example ECG which can be quite important. Pitfalls are maybe some technical problems which are easily solvable.
11. What have been the benefits and the pitfalls seen from your perspective?	Well my communication with my field nurse was always really good but now it is more frequent, intense and better. It is very positive.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	I get notifications that measurements have been taken and I can then comment on them inside the programme. My field nurse is stationed in the same building as I am so we communicate more through meetings but we often exchange notes over the programme.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	Very good. It allows me to communicate and observe the patient more in detail. Information I get is quicker and more precise. And that helps me to take better care of the patients.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	I am very happy that I am in this project. I wouldn't like it to be any more complicated than it is. Also I would like communication to open between us and specialists. It would be really good if it could one day be available to younger and wider population.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 3	
1. Please introduce yourself shortly (job & education)?	I am a field nurse. I have a bachelor's degree in nursing.
2. How long have you worked in your current job?	For 8 years.
3. What is your age?	I was born in 1964. So 51.
4. Can you describe the care you provide to frail multimorbid patients?	Regular visits to the patients' home. We take their measurements, consult with them, observe their health status etc. We also do prevention and we have group meetings. Every Wednesday we meet with group of chronic patients (diabetics for example). Meetings last for an hour.

PROFESSIONAL 3	
5. Can you describe the ICT solution that you are using?	CMS and CareWell at the moment.
6. Do you think it has supported the integrated care? Please explain.	I think CareWell helped a lot in it.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The possibilities are much greater. Because of the measurements we take, because of increased frequency of visits to the patient, the educations it provides. I see the picture much clearer now regarding patient's health status. They are more motivated and even the family, the caregivers, are more involved. Regarding my GP, we have always had really good communication so that hasn't changed. Patients do show progress in their care about themselves. They are motivated, the ask questions and are in general more interested in their health.
8. What changes in the ICT have you seen in the last months?	Well for starters we also went through education. It is easier to make measurements. But the most important thing is the trust we gained from the patients that are involved. They eagerly wait for us to come to their home and talk to them, take measurements… It is better in every way.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	It takes up some of my time so maybe I have less time for other patients.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Pitfalls are technical problems. Which are fixable but they are still here. Everything else is perfect! Really perfect!
11. What have been the benefits and the pitfalls seen from your perspective?	No. Communication between my GP and me has always been wonderful. So I'm not seeing any changes.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	By notes in the programme itself. If I see something out of the ordinary when I take patients measurements than I make a note for the doctor to see.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	It is good although I have such communication with my GP that we do most of our meetings in person.

PROFESSIONAL 3	
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	I would really like for it to really come alive. CareWell. I think it is the next level in care for my patients.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 4	
1. Please introduce yourself shortly (job & education)?	I am a GP employed in this health centre but I also work at medical college part time as a docent (assistant professor) and I am a primarius.
2. How long have you worked in your current job?	I have been working here for 15 years. But I am a GP for 20.
3. What is your age?	I am 53 years of age.
4. Can you describe the care you provide to frail multimorbid patients?	Observing their primary illness as well as comorbidities, observing their socio-economic status which greatly influences their health as well as their capability to take care of themselves. We help find caregivers if needed be.
5. Can you describe the ICT solution that you are using?	Well I use MCS. Also if I need to find anything I look up data bases which are significant. And CareWell is here as well.
6. Do you think it has supported the integrated care? Please explain.	Yes. First of all, communication between me, patient and field nurse is much better. CareWell allowed them to take better care of themselves in a way that they can monitor their own status. By providing them with virtual educative materials they understand their illness better. Also they are happier because field nurse is providing regular visits.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Quality of content has changed. Now I have better insight of their illness which was lacking before. I am more focused on them and the change in their health status. In other words, I am more aware. Patients who are involved are definitely more active since the beginning of the project. They are now aware that they also have the ability to influence their health. It is necessary for them that someone educates them and supports them in that self-care. CareWell allows them to be active in that.
8. What changes in the ICT have you seen in the last months?	I have an example of patients who went under surgery and because of CareWell and support of me and my field nurse they had been more mentally stable. More reassured and positive. We have to thank communication for that. It is much better. We were at their home as soon as they were released from the hospital.

PROFESSIONAL 4	
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	I have a specific situation here. Students from medical college come here on practice so they help me a lot. That allows me to dedicate more time to chronic patients with comorbidities so I haven't felt any difference.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	It gives excellent care to these really ill patients with comorbidities. Pitfall is that the medical data from Ericsson mobile health (CareWell) is not linked with our regular system but I hope the project comes alive and it will be possible someday.
11. What have been the benefits and the pitfalls seen from your perspective?	Communication has always been really good but now it has changed for the better in a way that it has become more interesting, more dynamic with more content.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	I write notes regarding patient's blood pressure for example asking the nurse to pay more attention to that specific measurement. To make a measurement again if needed etc.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	It's an excellent tool! Aside the technical issues that sometimes occur it is perfect for that type of patients. It helps the GP regarding their time because patients under CareWell do not need to come in the office often. It can save patients from unnecessary examinations... It should be directed to specific chronic patients. The ones that have more grave health status.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	I would love the communication to remain at this high level. I am very satisfied with this project and with the collaboration we all have.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 5	
1. Please introduce yourself shortly (job & education)?	I am a field nurse in this health centre. I am also a coordinator for field nurses. I have a bachelor's degree in nursing.
2. How long have you worked in your current job?	5 years.
3. What is your age?	I am 33.

PROFESSIONAL 5	
4. Can you describe the care you provide to frail multimorbid patients?	We enter their homes and take care of them. Prevention for one, observing the patient, taking measurements and controlling them. Once a month I have a meeting with chronic patients where I hold educational classes for them and take measurements like blood pressure and blood sugar.
5. Can you describe the ICT solution that you are using?	We use MCS where we have our data (nurses) and Ericsson mobile health within CareWell.
6. Do you think it has supported the integrated care? Please explain.	Very much so. Patients involved have much better care than the rest of our patients.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Absolutely. Now we have option of making more measurements than usual. We than also can notify the GP practically instantaneously and discuss some things with him…there are more options but also more responsibility. Patients are more cooperative, they use the educative materials they received as well as their smart phones. When they see a measure taken they are very interested in making it better. They try more to be healthier.
8. What changes in the ICT have you seen in the last months?	It has a lot. Patients have the feeling that we care and that they are important to us. They have the feeling that they are constantly supervised, they are happy that they don't have to go to the hospital to certain measurements that we can do by the means of this project. Most of all they are happy that they now have direct link with the GP through us, through mobile health.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Not really. I still do my house visits to all my patients and I still hold aforementioned group meetings regularly.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	There are far more benefits than pitfalls. We can observe and control illness of the patient better, early intervention and complication prevention. There were a few cases when my GP and I had to act quickly because of shift in measurements with medication adjustments and it was quick and efficient. Patient feels safer, as well as his/her family (caregivers). Regarding pitfalls…well uncooperative patient for one and also I think wrong patient choosing because I have patients who, in my opinion, would certainly fit better in this project but who did not meet the conditions regarding what chronic diseases they had to have to enter the project.
11. What have been the benefits and the pitfalls seen from your perspective?	Absolutely. Before my GP and I had almost no communication but part of a reason for that is we didn't have common patients. He is very motivated and we have regular meetings to discuss everything that there is about patients.

PROFESSIONAL 5	
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	Sometimes over notes in the programme itself but usually in person because we are close so it's an option. It's easier and more effective that way. If something is urgent than I call him straight away.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	Excellent!
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	I am very pleased with this programme! Educational materials are really good! It would be great if we could have the option to print out these measurements we took so patients could take those results when they go to see a specialist. Also it would be perfect that it could one day be available to all field nurses throughout the country.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 6	
1. Please introduce yourself shortly (job & education)?	I am a field nurse. I have a bachelor degree in nursing.
2. How long have you worked in your current job?	About 10 years.
3. What is your age?	44
4. Can you describe the care you provide to frail multimorbid patients?	Discovering new chronic patients, education, prevention , just talking to patients about quality and way of healthy life
5. Can you describe the ICT solution that you are using?	We use Medicus for administration and Ericssnon mobile health (CareWell) since the project began.
6. Do you think it has supported the integrated care? Please explain.	Definitely.

PROFESSIONAL 6	
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	There is more responsibility. My day is full but I think that's good. Certain patients do take better care of themselves.
8. What changes in the ICT have you seen in the last months?	Well educational materials really help and since they are older they respond to movies a lot better than me just saying things.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	It takes away some of my time so I may not be available to other patients as much as I should be. I have another project aside from this one so…
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	All in all I see only benefits and potential spread of this kind of mobile health system.
11. What have been the benefits and the pitfalls seen from your perspective?	No. It stayed the same.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	It's very good. I would love it if it could become a standard tool.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	I usually write notes about certain things that bother me or that should be approached in more detail.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	I like it very much and I would like for it to be a standard tool.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

A.3 Lower Silesia

PROFESSIONAL 1	Nurse practitioner
1. Please introduce yourself shortly (job & education)?	Graduate nurse at the Admissions Chamber of Internal Medicine of A.Falkiewicz Specialist Hospital
2. How long have you worked in your current job?	30 years
3. What is your age?	50 years old
4. Can you describe the care you provide to frail multimorbid patients?	I provide professional nursing care to frail multimorbid patients.
5. Can you describe the ICT solution that you are using?	Advanced technologies can facilitate and improve nursing practice and effective contact with the patient.
6. Do you think it has supported the integrated care? Please explain.	Yes, integration and telemedicine tools allow for better and cheaper healthcare systems.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	My work as a nurse has not changed and the introduction of ICT proved to be an excellent form of patient care. I do not delegate any responsibility to others and the additional responsibilities I'm doing well. Patients actively participate in medical care of their owns by carrying out measurements daily and participate in monthly visits of nurses and doctors.
8. What changes in the ICT have you seen in the last months?	ICT is a new form of medical care for patients with the passage of time they are more and more involved in this form of care. Monthly nursing visits, which includes: surveys and measurements of vital parameters transferred to the Platform cause that patients have more confidence in us.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Integrated care program causes the patient and family are more involved in activities related to health.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Advantages: high quality care. Electronics disrupted badly affects the well-being of the patient.
11. What have been the benefits and the pitfalls seen from your perspective?	Patients taken into the care of ICT willing to cooperate with Primary Care and Hospital Care.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses?	Using the ICT solutions is a perfect form to collaborate with all centres of health and social care.

PROFESSIONAL 1	Nurse practitioner
• Others?	
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	Using ICT system allows for professional work for patient weal.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	ICT allow to obtain information about the patient and give the possibility to plan consultation if necessary.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	Integrated care and use of ICT solutions should work on a permanent basis and not just during the project.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 2	
1. Please introduce yourself shortly (job & education)?	Specialist of behavioural nursing, Deputy midwife at Central Admissions Ward of A.Falkiewicz Specialist Hospital
2. How long have you worked in your current job?	36 years
3. What is your age?	56 years old
4. Can you describe the care you provide to frail multimorbid patients?	I supervise frail patient care staying in the admission room by surrounding him with medical care and providing it with security needs, respect and physiological needs.
5. Can you describe the ICT solution that you are using?	I do examinations and send their results through mobile devices to the platform. These are measurement, RR ECG, oxygen saturation, weight heart rate, spirometry, glucose.
6. Do you think it has supported the integrated care? Please explain.	Certainly it gives support us significant benefit for the patient like: • sense of security • Ability examination for 24hrs • Constant access to their data
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The implementation of ICT gave the opportunity for more efficient use of time for a patient who needs a personal touch and support. Cooperation between professionals is directed and divided responsibilities into functions in this care is more efficient. The patient and his family are actively involved in the process of care.

PROFESSIONAL 2	
8. What changes in the ICT have you seen in the last months?	ICT is growing all the time giving the opportunity for new applications to benefit of the patient. It gives the ability to view history On-line. Easier contact with a patient It provides continuity of care.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Controlling of patients allows for better and meaningful insight information on the condition of the patient: • Assessment its efficiency and self-reliance • Assessment of mental condition • Social and environmental assessment which allows for better define their needs and fit help
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Benefits: Improving quality of life. Better matching of services for needs. Pitfalls: Lack of cooperation and complementarity of medicine and IT. Lack of funding for ICT
11. What have been the benefits and the pitfalls seen from your perspective?	Better and closer cooperation focused on the patients and their needs.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	Development of cooperation with aid centres and psychologist.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	ICT simplify more active participation of patients and their families in the care processes which impact to strengthens the patient's health
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	ICT provides integrated care assuring continuity of health promotion, prevention, diagnosis, therapy and rehabilitation.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	Education of patient through the multimedia application
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 3	Social Worker
1. Please introduce yourself shortly (job & education)?	MSc Pedagogue, Junior Assistant Social Worker of A. Falkiewicz Specialist Hospital in Wroclaw
2. How long have you worked in your current job?	10 years
3. What is your age?	34 years old
4. Can you describe the care you provide to frail multimorbid patients?	I provide social care through social guidance and professional social work with frail patients and their families.
5. Can you describe the ICT solution that you are using?	Integrated care program which is used for social action is this mobile application for patient is concerning to need in social services platform and educational integrated health information systems for patient.
6. Do you think it has supported the integrated care? Please explain.	Health systems integration with social systems [application and educational platform] perfectly complete and creates holistic frail patient care.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Work with Integrated Care System of is simpler, more clear and faster. Patient may signal and define needed social service by himself. Such care is individualized and matches to patients current needs. ICT will enhance cooperation among various professionals. Functions and responsibilities are clear and everyone does what is necessary to do. All functions are complementary and guarantee high quality services. Patients can participate actively in the care of themselves, they are liable for daily testing of medical measurements and for define their needs of social services.
8. What changes in the ICT have you seen in the last months?	ICT is growing and it means development and occur new solutions. One of them is mobile application for patient. Thanks to it patient may report his need for social services. Knowing the reported needs of patients by mobile application or educational platform and also by Call Centre I can effectively reply to them. In this way the frail patient can be empowered and stay longer at his own home.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Daily work with patients and his family carry risk of incongruity solutions on the grounds of imperfect flow of information about patient, his health and social condition. ICT is helping to expedite this flow and then help is more effective.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Benefits are based on high quality and high effectiveness of patient empowerment. Pitfalls are based on fact that there are no perfect systems and electronics can fail [hardware conflicts and failures, errors].
11. What have been the benefits and the pitfalls seen from your perspective?	There has been close co-operation between the Primary Care unit and hospital for Patients under ICT care and also between other external parties like social service providers.

PROFESSIONAL 3	Social Worker
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	ICT is a perfect tool for to cooperate with social welfare centres in the district, social service providers and caring on for frail patient.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	This cooperation is based on completing the cross and professional activities of persons according with their competences.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	ICT allows to get reliable and holistic information about the patient and schedule effective actions in cooperation with other professionals.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	I think that there should be special attention to the possibility of social services for frail patients, because it is necessary support of care which is based on the opportunity to stay in their own homes.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 4	Physician - specialist in internal medicine
1. Please introduce yourself shortly (job & education)?	I am a specialist in internal medicine, in the course of specialization in neurology. I work in the Department of Internal Medicine and Geriatrics A. Falkiewicz Specialist Hospital in Wroclaw as a senior assistant. In addition, I carry on medical duty at the Branches of the Interior Hospitals in Olesnica and Zabkowice Slaskie and SOR in Zabkowice Slaskie. I am consultant in the framework of a private placement of primary health care.
2. How long have you worked in your current job?	10 years
3. What is your age?	37 years old
4. Can you describe the care you provide to frail multimorbid patients?	We try to monitor multimorbid patients and treat in range of all, or at least the key conditions. Often it require adjustment and individualization of therapeutic targets in order to avoid complications or adverse drug reactions, additional problem is to maintain or restore physical function of patients and support for the patient and family. I deal with this

PROFESSIONAL 4	Physician - specialist in internal medicine
	type of patients care in hospital. This care is conducted in cooperation with the family doctor and nurse.
5. Can you describe the ICT solution that you are using?	In every day practice I use the internet for finding medical information, viewing of medical portals, including watching lectures and educational films, I use applications on medicines, diet, lifestyle. I communicate with colleagues and I consult with doctors of other hospitals using a mobile phone and e-mail. Occasionally I also take part in conferences as well as teleconference.
6. Do you think it has supported the integrated care? Please explain.	ICT is now an essential part of patient care. to get full information about diseases and their treatment, access to the results and conclusions from randomized trials, experts help in decision making. With ICT I join with colleagues specializing in other areas of medicine than I was asking them for advice on dating patients for treatment / consultation outside my hospital, I contact with a social worker and families of patients. I can not imagine an integrated patient care without the use of ICT.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The use of ICT will significantly improve my work, I can quickly reach the required data, quickly contact with other doctors for advice or arrange a consultation, I can show them the data / articles / results of imaging tests, contact with the patient or his family on the results of research / treatment. I communicate more easily with other specialists, besides I did not notice a significant difference in the relationship. If the decision therapeutic / diagnostic goes beyond my specialty and is based on the opinion of an appropriate specialist / expert. Yes, I believe that, given access to the guidelines, recommendations proceedings societies Polish, European, American, I am obliged to refer to the relevant information and diagnose and treat each patient according to them, of course, taking into account individual modifications. It's a huge responsibility. Patients above 75 rather prefer a passive attitude, younger, and especially those at working age are often actively seek information about the disease, looking for people with the same health problem - exchange of experience, tips, show activity in the treatment process, closely watching their bodies, analyze test results
8. What changes in the ICT have you seen in the last months?	I did not notice any changes yet. It often helps to find the right language, which pass information about the disease and recommendations, the patient can benefit from the information available on professional medical portals, addressed to patients, they can communicate with other patients with similar

PROFESSIONAL 4	Physician - specialist in internal medicine
	problems during the visit can explain some problems with pictures, videos, charts, show and explain the method of therapy.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Integrated Care Program applies to outpatient care, while I was working in - hospital, hospital doctors in Poland does not fulfil the care of patients who leave the Hospital. Telecare allows the consultation results of patients between GP and specialists, easy evaluation and possibly to propose the modifying treatment.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Integrated Care Program allows daily monitoring of vital parameters of the patient and rapid response in the event of material misstatement. Additionally observe that patients covered by the project are beginning to pay more attention to a disease that is monitored, observe your own body and possibly compounds. Deviations from the time of day / situation / food etc. Also begin to better cooperate in the treatment. On the other hand, there may be a tendency to pay less attention to concomitant diseases both the physician and the patient.
11. What have been the benefits and the pitfalls seen from your perspective?	In the hospital- it is much easier to communicate via mobile phone, e-mail. Between the hospital and family doctor, nurses - rarely make contact with family doctors or Primary care nurses. Others – it is much easier to communicate via mobile phone, e-mail.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	In the hospital - I used to use a phone call, sending emails, share articles / links about the interesting diseases. Between the hospital and family doctor, nurses I used to use occasional phone calls. Other (social care) - phone calls, e-mail occasionally.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	We do not use ICT solutions fully into the coordination and planning of diagnosis / treatment. I think that soon it will be a perfect solution, providing improvement and quality of care.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	The cooperation is satisfactory, although we would expect greater involvement of creativity on the part of our specialists. We have no problem with the flow of information on a computer system in force in the hospital, suggestions for changes to improve the work in the system are taken into account and these changes are effectively implemented. At the same time, unfortunately, the employer does not provide

PROFESSIONAL 4	Physician - specialist in internal medicine
	us with electronic access to international journals / medical platform recognized as trustworthy sources of medical knowledge (we need to pay for access)
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	No comments
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 5	Physician - specialist in internal medicine
1. Please introduce yourself shortly (job & education)?	I am a doctor - I have a specialization in internal medicine and specialization in geriatrics. I work for the Department of Internal Medicine and Geriatrics at A. Falkiewicz Specialist Hospital in Wroclaw as a senior assistant. While working in the hospital I am doing an ultrasound examination of the abdomen and working in Geriatric Clinic operating in our hospital. Every year I try to take part in training courses and conferences on internal medicine as "National Training Conference - Polish Advances in Internal Medicine"; The Congress of the Academy after Diploma on the Internet "and geriatric as" Congress Academy after Diploma Geriatrics "," Woman and Men.Healthy Aging, "" National Congress of Ageing", etc.
2. How long have you worked in your current job?	13 years
3. What is your age?	42 years old
4. Can you describe the care you provide to frail multimorbid patients?	Due to the profile of our department, most of our patients are patients suffering from geriatric average 3-4 chronic diseases and multimorbid -We care of these patients, we try to look at them holistically by focusing not only on one ailment because it is well known that the tightening of one disease as the "domino effect" will exacerbate another, and treating these patients need to be taken into attention in drugs therapy that may come together in interactions and produce side effects which may even lead to another hospitalization. We attach great importance to rehabilitation, it is important to support families and care nurses and medical sitters.
5. Can you describe the ICT solution that you are using?	Internet -to complement of medical knowledge, learn from the latest guidelines, etc., Thanks to the internet we have quick access to the results of our patients on pages of laboratories; Cell-phone plan allows fast imaging studies outside the institution (e.g. CT), we use application manual on drugs,, participate in multimedia presentations presented

PROFESSIONAL 5	Physician - specialist in internal medicine
	by representatives of pharmaceutical companies (many companies also provide information on medicines via e-mail), occasionally I participate in medical teleconferences organized by pharmaceutical companies via the Internet
6. Do you think it has supported the integrated care? Please explain.	Of course, that ICT supports integrated patient care - allows you to expand knowledge about the disease data, allows rapid consultation with specialists and quick access to the results of research and contact with the patient family for a social worker, which improves the quality of patient care
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	ICT every day helps me in carrying out my work, allowing for faster use of research results, opinions of experts to expand my knowledge. Using specialist opinion, what supports my decisions, but for which I ultimately my responsibility. As every doctor, I should update the knowledge, what is much easier with ICT, it is the duty of every physician. Patients often have knowledge according to their disease from internet, They are using their knowledge according to results of research and diagnostics conducted on which to perform it must consciously agree to benefit .Patients and educational materials available in the hospital (usually booklet), cooperation with the patient, his understanding of the problem helps to care him.
8. What changes in the ICT have you seen in the last months?	I did not notice any. Often, patients search information about their illnesses on the internet including the medical portals, they exchange their knowledge with other patients, during talks with patients I used to try to answer the questions of the patient to explain their doubt
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Telecare assists in cooperation between physicians of different specialties, primary care doctors and a social worker on establishing a strategy for further patient care.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Integrated Care Program allows daily monitoring of the patient in the range of checked parameters and quick correction of treatment if necessary. But we have to keep in mind that patients covered by the project are patients with multimorbidity and cannot forget about the accompanying diseases.
11. What have been the benefits and the pitfalls seen from your perspective?	Fast communication via mobile phones and e-mails
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations?	I used to talk to professionals family doctors, a social work and the patient's family via the Internet and telephone conversations.

PROFESSIONAL 5	Physician - specialist in internal medicine
13. How have you used the ICT solutions in your collaboration with other professionals:	ICT is a tool that helps in planning and communication with the patient, improving care for them.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	In my opinion, such cooperation is good, thanks to the computer system at the hospital, we have the ability to quick view of the results of diagnostic tests and patient information. We can quickly schedule imaging studies that we have to do outside the hospital. We can establish patients consultations with specialists.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	No answer
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 6	Physician - specialist in internal medicine
1. Please introduce yourself shortly (job & education)?	I am graduated at the Faculty of Medicine at the Medical University of Silesia in Zabrze. During my studies I was an active member of the Student Association at the Department of Forensic Medicine in Katowice and the Student Association at the Silesian Centre for Heart Diseases in Zabrze. My post-graduate internship I have conducted in the Department of Internal Medicine and Geriatrics A. Falkiewicz Hospital. in Wroclaw. From 11.2008 I was hired as a junior assistant from 2011, assistant and senior assistant from 11.2014 in ww.placówce. The training took place from 2008-2014 in the framework of specialization in internal medicine completed the submission of the State examination with a positive result 11.2014 - 11.2014 title of specialist in internal medicine. From 07.2015 am in the process of specialization in cardiology - initially im. Sokołowskiego Specialist Hospital in Walbrzych, currently Silesian Center for Heart Diseases in Zabrze. I work in the Department of Internal Medicine and Geriatrics Hospital. A. Falkiewicz in Wroclaw as a senior assistant. In addition, since 2011 working in the Health Centre in St Catherine, Branch Siechnice, where from 04.2015 addition to working as a doctor perform the duties of the manager.
2. How long have you worked in your current job?	8 years
3. What is your age?	33 years old

PROFESSIONAL 6	Physician - specialist in internal medicine
4. Can you describe the care you provide to frail multimorbid patients?	In a situation when the patient goes into the so-called acute condition (often life-threatening conditions) aid is in the treatment code, designed to save lives, prevent possible complications. At the same time controlled all vital parameters, takes care rehabilitation in order to avoid complications at a later stage, eg health. Bedsores, malnutrition. In step recovery current patient treatment is optimized (the amount of drugs and dosage). On discharge in the information shall contain recommendations that are in terms of physician ambulatory care what kind of hint to proceed with the patient. Sequentially GP in cooperation with the nurse cares for the patient medically - in the first stage of recovery frequency of visits is relatively common, but allows for a possible revision of the proposed therapy at discharge.
5. Can you describe the ICT solution that you are using?	.I am using the Internet for: medical information, medical portals, lectures, educational films, the use and the prices of medicines, dietary advice, recommendations, relevant lifestyle, teleconferencing. In addition, through mobile applications I consult with doctors from other institutions.
6. Do you think it has supported the integrated care? Please explain.	Today, it is practically impossible in a fully professional way lead of care for patients without integration. Based on ICT medical technology not only allow for a quick consultation regardless of the form of the consultation, but allow much faster to implement directional diagnostics and patient treatment which very often is very important. ICT is not only direct medical care for the patient but also multi-level help for the sick - social worker, family, physician assisted outpatient.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	ICT is definitely enabled to improve the work, a diagnostic decisions or therapeutic, consultations of doctor with a different specialty, arrange for a consultation. In addition, I have all day, unlimited access to a database of medical, imaging results, medical data. I can also at any time contact with the patient / family. Contact with other professionals is much easier. The relationship has not changed. In a situation where the therapeutic or diagnostic decisions are beyond the scope of my expertise / specialization leaning from the advice of a specialist in a given specialty. In the era of unrestricted access to the guidelines, scientific advice, Polish, European or American scientific societies rests on an obligation to familiarize themselves with these guidelines and apply them in daily practice. In most cases, access to medical e-knowledge makes the previous paper

PROFESSIONAL 6	Physician - specialist in internal medicine
	form called education becomes of secondary importance. Over the years, I observe a tendency to intensify the so-called active participation in the stage of diagnosis and treatment. A few years ago geriatric patient presented a completely passive attitude in both processes. This is the result not only access to information about the disease, but also the exchange of experiences with other patients, and importantly, the realization that the doctor only a small percentage is responsible for the fate of the patient (to establish the diagnosis, treatment, control) - further proceedings, ie adherence , lifestyle modification dependent of the patient. Younger patients often actively involved in the diagnostic-therapeutic and healing. The big problem is the group of patients who do not want to sound diagnosis and treatment based on it, however, at the entrance to the office has a ready diagnosis and treatment - sees the doctor as a person who is the only required to sign the relevant documents (tests, prescriptions).
8. What changes in the ICT have you seen in the last months?	It seems a great opportunity for the further development of medicine in Poland by adopting the law on telemedicine. I often use photographs, films, drawings during a visit in order to illustrate the essence of the sick problem.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	The ambulatory patient of telecare allows for quick response of medical personnel in the case of incorrect measurements thus avoiding hospitalization (complications, the economic aspect). So far, in a situation where patient with medical problem had tried to register for outpatient medical aid - in Poland, the average waiting time for an appointment is 3-10 days. Typically, the patient's medical condition develops so that the patient goes to the ER at the hospital.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Integrated Care Program allows for daily monitoring of vital parameters of the patient and rapid response in the case of material misstatement. In addition, patients who passively approached to active participation in disease diagnosis and therapies starting the better cooperation in the treatment. A major problem seems to be the degree of trust in the doctor-patient help, the same way of thinking. No doubt the future will indicate the common courses designed to unify the procedure.
11. What have been the benefits and the pitfalls seen from your perspective?	The communication in hospital is much easier via mobile phones and e-mail. Contact between the hospital and family doctor, nurses is made by phone and e-mail. Others - much easier communication is conducted via mobile phone and e-mail.

PROFESSIONAL 6	Physician - specialist in internal medicine
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	In the hospital - I use a phone call and sending emails, sending articles / links about the interesting diseases. Between the hospital and family doctor, environmental nurses there are used occasional phone calls. Other (welfare) –we use occasionally phone calls, e-mail.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	We do not use ICT solutions fully into the coordination and planning of diagnosis / treatment. I think that soon it will be a perfect solution, providing a temporary improvement, logistics and consequently the quality of medical care
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	The cooperation is satisfactory, although we would expect greater involvement of creativity on the part of IT facilities. The flow of information on a computer system, suggestions for changes to improve the work in the system are taken into account and these changes are effectively implemented. The big problem is the lack of electronic access provided by the employer to the English-speaking medical platforms, medical journals (access fee is required).
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	No comments
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

A.4 Veneto

PROFESSIONAL 1	
1. Please introduce yourself shortly (job & education)?	M.D. with specialization in Oncology and in Public Health. Actually I am working as Director of the Primary Care Services at ULSS N.2 of Feltre. Among my duties I am the responsible for the Home Care Nursing Services and the management of the GPs.
2. How long have you worked in your current job?	Seven months.
3. What is your age?	55
4. Can you describe the care you provide to frail multimorbid patients?	We have a set of protocols and procedures that complies with the needs of the patients

PROFESSIONAL 1	
5. Can you describe the ICT solution that you are using?	The ICT developed within the CAREWELL services is a door to the future. It allows to all the professionals (Nurse, GPs, etc…) to have a comprehensive health and social profile of every patient that enters in contact with the Primary Care and the Social Care services. Moreover it allows the GPs to telemonitor the patient thanks to the cooperation of the Homecare Nurses that perform test at the patient's home according to a telemonitoring schedule. The GPs can also ask for a consultation to the Hospital Specialist via the same ICT solution.
6. Do you think it has supported the integrated care? Please explain.	I think this is a step forward to reach a better integration between Hospital and Primary Care services.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	My workflow is not changed directly but it has changed the relations with the other professionals, creating more cooperation since it allows to go beyond the work organized by compartmentalized sectors
8. What changes in the ICT have you seen in the last months?	The major changes are the Patient's Dashboard and the services that connects primary care professionals to hospital care professionals. My use of the ICT solution is devoted to the management of the services, I am not working in the field in direct contact with patients.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	The solution has been introduced since few time. Probably it will take more time to assess a more described impact.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	The benefits are the same described in the previous answers. Attention has to be paid to the change management approach when you introduce innovation.
11. What have been the benefits and the pitfalls seen from your perspective?	Yes. The professionals have now an effective channel of communication that allows them to consult each other on the patients. And this applies between primary care professionals and between primary and secondary care professionals.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations?	I have been using the Patient's Dashboard as a toll that allows me to have all the information on a patient at a glance and this helps me in finding the best solutions to organizational problems around the services delivery to a specific patient.
13. How have you used the ICT solutions in your collaboration with other professionals:	The tool is extremely helpful in facilitating the coordination, the planning and the communication about the patient.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	I have been working to develop the tool since I started to work here at ULSS 2. As always when there is a change, there has been some resistances but it has been and is an intriguing path to improve the services we deliver to people who are in need.

PROFESSIONAL 1	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	I like to think to CAREWELL as a step forward to new innovations and integration of professions and professionals at service of the citizens.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 2	
1. Please introduce yourself shortly (job & education)?	I'm a nurse with a master degree in healthcare management. Since 2013 I am the head nurse of the Territorial Operative Centre. Before I have been working for 15 years as Home Care Nurse.
2. How long have you worked in your current job?	Two years
3. What is your age?	42
4. Can you describe the care you provide to frail multimorbid patients?	I am responsible for monitoring and supervising the transition for the frail patients from different care settings: home, hospital, country hospital, Nursing Home. As part of my job I also give advice to the other healthcare professional in order to smooth the path of the patients.
5. Can you describe the ICT solution that you are using?	The evolution of the Territorial Informative System has allowed me to have a full and clear picture of the patient at primary care level. In one click I can check the evaluations of the patients, the services that have been delivered to him, I can see who are the main professionals involved in his/her care and I can add all the information I gather in my job as switch point between primary and secondary care.
6. Do you think it has supported the integrated care? Please explain.	Yes, it is very useful and supportive, as explained in the previous answer.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	My workflows has changed since: It allows me to speed up the process of research of the information on the patient. It helps to reduce the paper based job. It connects directly the professionals of the Hospital with the professionals of the Primary Care and vice versa. Also my relations with the other professionals have changed since it refers to me with more information already gathered on the patient's conditions and pathway.
8. What changes in the ICT have you seen in the last months?	
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	It has the impact I described before, moreover ti allows me to have more information on the patients when I am dealing especially with the caregivers.

10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	I haven't noticed pitfalls but I benefit of more information, widespread among all the relevant professionals in real or near time.
11. What have been the benefits and the pitfalls seen from your perspective?	The relations with the Head Nurses of the Hospital department have changed: infact they can access the ICT system to gather information on the patient at Primary Care level and the Territorial Operative Centre now operates as reference point in case of in deep analysis of the patient condition and situation. This change also affected the communication with all the other professionals at hospital and primary care level involved in the management of a patient.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations?	Yes, as described before.
13. How have you used the ICT solutions in your collaboration with other professionals:	I would describe it as fast, almost immediate and effective.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	There where a very good cooperation in the development phase. I have been involved in a continuous discussion on issues and solutions, explaining need and giving advices.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	I hope that in future there will be the possibility to have further development and integration between the services.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 3	
1. Please introduce yourself shortly (job & education)?	I am the Head Nurse of a Medical Hospital Department with 25 beds. I am responsible for the nursing services within the Department, managing the nurse team and supporting the Chief Physician. I hold a degree in nursing with a specialization in management.
2. How long have you worked in your current job?	Since 1992.
3. What is your age?	50
4. Can you describe the care you provide to frail multimorbid patients?	When a patient is admitted to the department, a BRASS (Blaylock Risk Assessment Screening) is administered to the patients in order to evaluate the risk of a difficult discharge. For the patients that are identified as frail and of difficult discharge, the information is sent to the Territorial Operative Centre that forwards it to the relevant primary care services. At the discharge, an nurse discharge letter is issued for the Home Care nurse and a notice of

PROFESSIONAL 3	
	discharge is send to the social services if involved.
5. Can you describe the ICT solution that you are using?	Via the new Territorial Information System I can recall all the relevant information about a patient that is currently hospitalized and I can make a forecast of the following steps in the pathway of the patient. I can spot also in there will be obstacles or impairment in the next actions that have to be taken following the patient path.
6. Do you think it has supported the integrated care? Please explain.	Yes because it allows to have information to assess and treat the patient taking into account not only the information available in the Hospital Information Systems but also the multidimensional assessment made by the Primary Care and the services that has been or are delivered at home when a patient is admitted. It helps also to connect me with the professionals of the primary care in an easy way and it helps me also to check the information I receive from the patient and/or the caregivers about conditions and services delivered.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	It has speed up the process of getting information on a newly admitted patient. I can also delegate to the nurses working in the department to check the information on the patients. In this way also the relationship and the involvement of the patient and the carigivers changed because they feel I have already all the relevant information on the case and the can rely more on us.
8. What changes in the ICT have you seen in the last months?	The Patient dashboard give us a faster and more exact way to get information. It has helped me in addressing the patient and the caregivers towards the best solution to their needs
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Yes, as mentioned in the question 8.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	
11. What have been the benefits and the pitfalls seen from your perspective?	This system has strengthen the relations with our colleagues of the Primary Care.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations?	
13. How have you used the ICT solutions in your collaboration with other professionals:	Very good.
14. How would you describe the collaboration by using the ICT as	

PROFESSIONAL 3	
a tool to coordinate, plan and communicate about the patient?	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

A.5 Puglia

PROFESSIONAL 1:	SPECIALIST
1. Please introduce yourself shortly (job & education)?	Outpatient specialist in cardiology branch agreement
2. How long have you worked in your current job?	7 years
3. What is your age?	66years
4. Can you describe the care you provide to frail multimorbid patients?	Cardiological examination, echocardiogram, blood chemistry tests.
5. Can you describe the ICT solution that you are using?	
6. Do you think it has supported the integrated care? Please explain.	Useful for a more immersive doctor-patient relationship, the greater compliance to care and use of the device.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Especially in the relationship with the patient and with the professionals involved in care. The communication it is more facilitated through a system developed. No. No. Yes: both things
8. What changes in the ICT have you seen in the last months?	The patients feel much more involved through the use of technology.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Less home visits, fewer telephone inquiries, the patient's liking.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Reorganization of working hours.
11. What have been the benefits and the pitfalls seen from your perspective?	As already stated at paragraph 9.
12. Have you experienced any changes in the communication	

PROFESSIONAL 1:	SPECIALIST
between different parts of your organisation or with other organisations?	
13. How have you used the ICT solutions in your collaboration with other professionals:	
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	Optimum from every point of view.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	Optimum from every point of view.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	Enhancing computerization.

PROFESSIONAL 2:	NURSE - CARE MANAGER (Veglie)
1. Please introduce yourself shortly (job & education)?	Nurse - care manager
2. How long have you worked in your current job?	10 years
3. What is your age?	47years
4. Can you describe the care you provide to frail multimorbid patients?	Global assistance to chronic patients; surgery chronicity.
5. Can you describe the ICT solution that you are using?	Remote monitoring of home parameters: PA, blood glucose, pulse oximetry, and Body Weight.
6. Do you think it has supported the integrated care? Please explain.	Currently no, for difficulty of appropriating the data collected by patients to the shortcomings of the computer program available.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Yes, to support the patient at home. No.
8. What changes in the ICT have you seen in the last months?	
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Difficult to monitor regularly the home measured parameters.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Possibility of coordinating the care of patient all his needs.

11. What have been the benefits and the pitfalls seen from your perspective?	Many difficulties related to the placement of home tools and their operation.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations?	No.
13. How have you used the ICT solutions in your collaboration with other professionals?	
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	It could be great if there was an operator for the control continuously.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	Currently limited, but with a great potential.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	Technical support to the instrumentation for the assistance. Need to improve the computer program to facilitate access to the data collected at home with the possibility of reports. Reorganization of working time, which is currently insufficient to achieve the set objectives.

PROFESSIONAL 3:	**MMG (Veglie)**
1. Please introduce yourself shortly (job & education)?	MMG
2. How long have you worked in your current job?	33 years
3. What is your age?	65 years
4. Can you describe the care you provide to frail multimorbid patients?	Periodic medical checks with specialist advice and instrumental.
5. Can you describe the ICT solution that you are using?	Multimedia (telephone, mobile phone, Internet.)
6. Do you think it has supported the integrated care? Please explain.	More information more quickly, thus improving the service.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Yes, if the ICT network has the optimal standards, otherwise it is better the old method: telephone and direct contacts. Greater professional respect and solving clinical problems quickly. No Better awareness of their abilities and responsibilities. Yes: both things

PROFESSIONAL 3:	MMG (Veglie)
8. What changes in the ICT have you seen in the last months?	Demands for more qualified clarifications.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	What's App, email, some forms of tele-checks but with little effect because the standards are not optimal.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Yes. Reorganization of working time.
11. What have been the benefits and the pitfalls seen from your perspective?	Benefits: less home visits, fewer telephone inquiries, increased patient satisfaction. Adversity. Initial commitment of time to learn the new technology.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations?	
13. How have you used the ICT solutions in your collaboration with other professionals:	
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 4:	SPECIALIST
1. Please introduce yourself shortly (job & education)?	Pulmonology specialist
2. How long have you worked in your current job?	7 years
3. What is your age?	66 years
4. Can you describe the care you provide to frail multimorbid patients?	Specialist examination, lung function test, pulse oximeter, more specific tests
5. Can you describe the ICT solution that you are using?	Telephone, mobile phone, internet ...
6. Do you think it has supported the integrated care? Please explain.	Useful for a more immersive doctor-patient relationship, the greater therapy compliance and correct use of therapeutic device

PROFESSIONAL 4:	SPECIALIST
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Reorganization of working hours. Greater professional respect and solving clinical problems quickly. No. Awareness of their responsibilities. Yes: both things.
8. What changes in the ICT have you seen in the last months?	Clarifications most qualified.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Remote monitoring.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Re-organization of working time.
11. What have been the benefits and the pitfalls seen from your perspective?	Patient satisfaction, reducing the number of calls or clarifications.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations?	
13. How have you used the ICT solutions in your collaboration with other professionals:	
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	Excellent.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	Excellent.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	Helps the structure to organize daily activities, facilitates communication and exchange of information between operators. If widespread on the territory could facilitate communication and interaction between all involved professionals in a context of integrated home care.

PROFESSIONAL 5:	NURSE - CARE MANAGER
1. Please introduce yourself shortly (job & education)?	Nurse care manager, Master 1st level in nursing management for the coordination
2. How long have you worked in your current job?	10 years
3. What is your age?	53 years

PROFESSIONAL 5:	NURSE - CARE MANAGER
4. Can you describe the care you provide to frail multimorbid patients?	They are incorporated into an integrated system of care that includes: ADI, surgery of chronic cases.
5. Can you describe the ICT solution that you are using?	Means of detection of the pressure parameters, saturometry, body weight, blood glucose meter (monitoring mentioned above is executed by the patient or caregivers previously trained by care managers). The self-monitoring data is sent on an interface of the PC care program Puglia and viewed by care managers.
6. Do you think it has supported the integrated care? Please explain.	In an integrated system to support these tools can definitely be helpful for santitari operators. In a cultural and environmental context such as ours with a population of about 10,000 inhabitants where everybody knows, contacts and direct communication are privileged (patient, doctor, nurse, social worker).
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Patients' access increased both at home and in the clinic, had considerable increase ambulatory activity in relation to cardiology clinics, pulmonary medicine, diabetology. Rare urgent interventions for monitoring altered parameters. CareWell controls on patients were mainly performed by care managers. No. Yes. Yes.
8. What changes in the ICT have you seen in the last months?	Greater involvement of patients.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Contacts between patients and caregivers have increased.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	Like the previous.
11. What have been the benefits and the pitfalls seen from your perspective?	Benefits in the patient - care-manager communication
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	No. No. No. No.

PROFESSIONAL 5:	NURSE - CARE MANAGER
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	The sanitary criticality was discussed only with MMG. No. No. No.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	The majority of patients while using the self-measurement instruments of the parameters provided by the kit supplied with the patient's own home, they prefer direct contact with the manage care at the clinic or at home.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	Real-time access on self properly executed parameters helps the care manger and GPs to act quicker on critical issues.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	Many critical issues mainly to electronics equipment, often unreliable. Another problem is on the satellite shadow that at some points of our territory, does not allow sending data on the interface of our PC.

PROFESSIONAL 6:	GP
1. Please introduce yourself shortly (job & education)?	General practitioner full-time, no specialization
2. How long have you worked in your current job?	From 1986
3. What is your age?	63 years
4. Can you describe the care you provide to frail multimorbid patients?	ADI with all its necessities.
5. Can you describe the ICT solution that you are using?	Instruments for pressure detection, for the blood sugar, for the saturometry.
6. Do you think it has supported the integrated care? Please explain.	Surely, because it provides all the information necessary for my business.
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	Yes, they require a slightly greater commitment. No. No. Yes. Yes.
8. What changes in the ICT have you seen in the last months?	Improved care and prevention.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Patients felt more resilient and involved.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If	The work is more organized and effective results.

yes, please describe how?	
11. What have been the benefits and the pitfalls seen from your perspective?	The greatest benefit was the most organized work with greater commitment.
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	Surely greater collaboration communication. Anything. Above all. Much less.
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	By communicating their experiences. No. Above all. Less.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	As a server from which we all depend.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	A "surplus" as a reference point.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	Surely a greater commitment and continue.

A.6 Powys

PROFESSIONAL 1	GP/GP Practice Manager
1. Please introduce yourself shortly (job & education)?	Practice Manager
2. How long have you worked in your current job?	8 years
3. What is your age?	52
4. Can you describe the care you provide to frail multimorbid patients?	I cover the business end of the practice and have no face to face contact with the patients. As a practice we have an ageing population, we provide the full range of General Medical Services and advanced clinics for a number of chronic disease areas such as Diabetes and COPD. Patients have an allocated doctor and we encourage patients to see a regular doctor for continuity of care

PROFESSIONAL 1	GP/GP Practice Manager
5. Can you describe the ICT solution that you are using?	The CareWell project in Powys is driven forward the implementation and utilisation of 3 key ICT solutions, these solutions are Live throughout the healthboard but use is varied: My Health Online – an ICT solution that allows patients to record healthcare information relating to themselves and their conditions whilst also allowing the patient to manage their repeat prescriptions and book appointments with the GP practice. MS Lync/Skype for business – an ICT solution that enables both me and other healthcare professionals to seamlessly meet via VC to discuss, and help facilitate care needs for our patients in Powys. We are yet to use this solution within the practice but will be looking to benefit from the solution in early 2016. Website Information – Powys THB and GP practices themselves have established websites. The CareWell project is helping us focus on developing a "signpost" to direct our patient cohort to trusted offical sources of information regarding their conditions in the hope that this will help them self manage their symptoms and conditions and provide a more informed approach of knowing when they should seek care. The CareWell web pages are still under review and development at this stage and we are planning to engage with Patients via workshops during January 2016 and publish the web pages during February 2016.
6. Do you think it has supported the integrated care? Please explain.	At this point in the project we believe that the ICT solutions that are being deployed are having little effect on supporting integrated care this is simply because the use and utilisation of the solutions are poor/limited. We do believe that in year 3 of the project this will have a positive effect and increase the use of such solutions to support integrated care co-ordination and patient empowerment,
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The workflow is/has and will begin to shift specifically with the use of My Health online and the ambition to encourage patients to use the solution to book appointments online rather than via telephone. Patients do not yet make (more) decisions in their care as we are still in the process of implementing the solutions, however even by just becoming involved in the CareWell project they are beginning to participate more in their care/condition and awareness.
8. What changes in the ICT have you seen in the last months?	We have seen the deployment of MS Lync/Skype for business within Powys Teaching Health Board and the development of a webpage designed specifically for CareWell patients. The use of this technology has allowed us to begin to consider and offer better collaboration between

PROFESSIONAL 1	GP/GP Practice Manager
	healthcare professionals with the ability to communicate more timely and efficiently via virtual conference. It allows and will continue to allow the possibility of holding virtual conference calls with patients close to the home or within care homes through year 3 of the project.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Currently not. Although we have started to introduce MHOL which allows patients to book appointments on line and do their on-line prescription ordering by linking to the clinical record which reduces errors and makes the process more efficient for both patient and practice.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	The benefits are yet to be fully realised but we believe that through deploying and utilising the functionality of the ICT solutions we will: Able to offer better care and collaboration between healthcare professionals and patients. Provide patients with more "power" through information to support them in managing and understanding their conditions. Offer closer care to the home. Reduce travel needs within the Heath Board. The pitfalls have been: The dependencies of other third parties/software providers and the timescales for deployment/release. The lack of clarity from the local project team of what services were to be deployed under CareWell in Powys. The criteria and number of patients required to take part in the pilot was limited to 4 GP practices, this has been challenging in recruitment and enrollment.
11. What have been the benefits and the pitfalls seen from your perspective?	No Changes to note
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	No this has not been tested and unfortunately there remain some significant cross border issues between England/Wales which prevent much progress in this area although this should be possible within the Welsh hospitals
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	It is to early in the release of these solutions to determine this. We will be in a much better position to determine this through year 3 of the project.

PROFESSIONAL 1	GP/GP Practice Manager
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	Early stages of development
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	Will need to report later on in programme as too early to say.
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 2	GP/GP Practice Manager
1. Please introduce yourself shortly (job & education)?	GP Practice Manager (BSc Ergonomics. Human Factor Design)
2. How long have you worked in your current job?	2 years 5 months
3. What is your age?	23
4. Can you describe the care you provide to frail multimorbid patients?	Welshpool medical centre offers continued care to multimorbid patients. Patients are reviewed annually by GP/practice nurse for each of their chronic diseases. Patients unable to attend the centre due to their complicated needs are entitled to home visits by a GP. Patient at risk of admission to hospital are monitored closely on a virtual ward system by a multi-disciplinary team including GP's, community nurses and specialist Nurses. Patients who require care beyond primary care can be referred to Community Nurse specialists and secondary care resources.
5. Can you describe the ICT solution that you are using?	The CareWell project in Powys is driven forward the implementation and utilisation of 3 key ICT solutions, these solutions are Live throughout the health board but use is varied: My Health Online – an ICT solution that allows patients to record healthcare information relating to themselves and their conditions whilst also allowing the patient to manage their repeat prescriptions and book appointments with the GP practice. MS Lync/Skype for business – an ICT solution that enables both me and other healthcare professionals to seamlessly meet via VC to discuss, and help facilitate care needs for our patients in Powys. We are yet to use this solution within the practice but will be looking to benefit from the solution in early 2016. Website Information – Powys THB and GP practices themselves have established websites. The CareWell project is helping us focus on developing a "signpost" to direct our patient cohort to trusted offical sources of information regarding their conditions in the hope

	that this will help them self manage their symptoms and conditions and provide a more informed approach of knowing when they should seek care. The CareWell web pages are still under review and development at this stage and we are planning to engage with Patients via workshops during January 2016 and publish the web pages during February 2016.
6. Do you think it has supported the integrated care? Please explain.	At this point in the project we believe that the ICT solutions that are being deployed are having little effect on supporting integrated care this is simply because the use and utilisation of the solutions are poor/limited. We do believe that in year 3 of the project this will have a positive effect and increase the use of such solutions to support integrated care co-ordination and patient empowerment,
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The workflow is/has and will begin to shift specifically with the use of My Health online and the ambition to encourage patients to use the solution to book appointments online rather than via telephone. Patients do not yet make (more) decisions in their care as we are still in the process of implementing the solutions, however even by just becoming involved in the CareWell project they are beginning to participate more in their care/condition and awareness.
8. What changes in the ICT have you seen in the last months?	We have seen the deployment of MS Lync/Skype for business within Powys Teaching Health Board and the development of a webpage designed specifically for CareWell patients. The use of this technology has allowed us to begin to consider and offer better collaboration between healthcare professionals with the ability to communicate more timely and efficiently via virtual conference. It allows and will continue to allow the possibility of holding virtual conference calls with patients close to the home or within care homes through year 3 of the project.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	At this point in the project, there has been little impact on daily work with the patients. The only difference worth noting is a reduction in strain on pharmacy staff as a direct result of patients registered for My Health Online..
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	The benefits are yet to be fully realised but we believe that through deploying an utisiing the functionality of the ICT solutions we will: Able to offer better care and collaboration between healthcare professionals and patients. Provide patients with more "power" through information to support them in managing and understanding their conditions. Offer closer care to the home. Reduce travel needs within the Heath Board.

	The pitfalls have been: The dependencies of other third parties/software providers and the timescales for deployment/release. The lack of clarity from the local project team of what services were to be deployed under CareWell in Powys. The criteria and number of patients required to take part in the pilot was limited to 4 GP practices, this has been challenging in recruitment and enrolment.
11. What have been the benefits and the pitfalls seen from your perspective?	No Changes to note
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations? • Within the hospital • Between hospital and GPs and nurses? • Others?	At this point in the point in the project, the chosen ICT solutions have not been used in collaboration with other healthcare professionals. However, the practice is utilising other ICT solutions currently on offer to collaborate with local hospitals. These are as follows Electronic discharge summaries from hospital to GP practice Electronic referrals via WCCG Electronic receipt of test results from hospital to GP practice
13. How have you used the ICT solutions in your collaboration with other professionals: • Within the hospital • Between hospital and GPs and nurses? • Others (social care…)?	It is to early in the release of these solutions to determine this. We will be in a much better position to determine this through year 3 of the project.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	There are multiple ICT/technology already on offer in Wales that can support the CareWell initiative. However, the challenge faced is to integrate, co-ordinate and ultimately utilise these systems effectively to allow for improved care co-ordination and patient empowerment.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	No further comments
16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

PROFESSIONAL 3 -	**GP/GP Practice Manager**
1. Please introduce yourself shortly (job & education)?	GP (Family Doctor)
2. How long have you worked in your current job?	GP since 1998
3. What is your age?	50

PROFESSIONAL 3 -	GP/GP Practice Manager
4. Can you describe the care you provide to frail multimorbid patients?	Full range of primary care medical services including chronic disease management.
5. Can you describe the ICT solution that you are using?	The CareWell project in Powys is driven forward the implementation and utilisation of 3 key ICT solutions, these solutions are Live throughout the health board but use is varied: My Health Online – an ICT solution that allows patients to record healthcare information relating to themselves and their conditions whilst also allowing the patient to manage their repeat prescriptions and book appointments with the GP practice. MS Lync/Skype for business – an ICT solution that enables both me and other healthcare professionals to seamlessly meet via VC to discuss, and help facilitate care needs for our patients in Powys. We are yet to use this solution within the practice but will be looking to benefit from the solution in early 2016. Website Information – Powys THB and GP practices themselves have established websites. The CareWell project is helping us focus on developing a "signpost" to direct our patient cohort to trusted offical sources of information regarding their conditions in the hope that this will help them self manage their symptoms and conditions and provide a more informed approach of knowing when they should seek care. The CareWell web pages are still under review and development at this stage and we are planning to engage with Patients via workshops during January 2016 and publish the web pages during February 2016.
6. Do you think it has supported the integrated care? Please explain.	At this point in the project we believe that the ICT solutions that are being deployed are having little effect on supporting integrated care this is simply because the use and utilisation of the solutions are poor/limited. We do believe that in year 3 of the project this will have a positive effect and increase the use of such solutions to support integrated care co-ordination and patient empowerment
7. Has your workflow changed since the introduction of the ICT? If yes, please describe how. Has your relation with other professionals changed? If yes, please describe how.	The workflow is/has and will begin to shift specifically with the use of My Health online and the ambition to encourage patients to use the solution to book appointments online rather than via telephone. Patients do not yet make (more) decisions in their care as we are still in the process of implementing the solutions, however even by just becoming involved in the CareWell project they are beginning to participate more in their care/condition and awareness.
8. What changes in the ICT have you seen in the last months?	We have seen the deployment of MS Lync/Skype for business within Powys Teaching Health Board and the development of a webpage designed specifically

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	for CareWell patients. The use of this technology has allowed us to begin to consider and offer better collaboration between healthcare professionals with the ability to communicate more timely and efficiently via virtual conference. It allows and will continue to allow the possibility of holding virtual conference calls with patients close to the home or within care homes through year 3 of the project.
9 How the used of ICT supported you in your collaboration with the patient? Please describe how:	Little change visible as yet though ICT solutions are being utilised.
10. Has the Integrated Care Program had any impact on the daily work with the patients? If yes, please describe how?	The benefits are yet to be fully realised but we believe that through deploying and utilising the functionality of the ICT solutions we will: Able to offer better care and collaboration between healthcare professionals and patients. Provide patients with more "power" through information to support them in managing and understanding their conditions. Offer closer care to the home. Reduce travel needs within the Heath Board. The pitfalls have been: The dependencies of other third parties/software providers and the timescales for deployment/release. The lack of clarity from the local project team of what services were to be deployed under CareWell in Powys. The criteria and number of patients required to take part in the pilot was limited to 4 GP practices, this has been challenging in recruitment and enrolment.
11. What have been the benefits and the pitfalls seen from your perspective?	No Changes to note
12. Have you experienced any changes in the communication between different parts of your organisation or with other organisations?	ICT solutions have so far been used exclusively with patients. We are planning to use MS Lync to collaborate with social care.
13. How have you used the ICT solutions in your collaboration with other professionals:	It is too early in the release of these solutions to determine this. We will be in a much better position to determine this through year 3 of the project.
14. How would you describe the collaboration by using the ICT as a tool to coordinate, plan and communicate about the patient?	It is too early in the release of these solutions to determine this.
15. How would you describe the collaboration in implementing the ICT tool in your organisation?	It is to early in the release of these solutions to determine this.

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16. Please let us know any other comments you may have about the integrated care using the ICT solution.	

Appendix B: References

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