



D1.6 Public Final Report

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ABSTRACT

The Final Report is CareWell's project's closing report. It is intended for an external audience to gain an overview of the project objectives, activities and results. The report summarises the key aspects of the project and directs readers to appropriate project material for more in-depth information.

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STATEMENT OF ORIGINALITY

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Executive Summary

Patients with complex care needs are known to account for a disproportionate share of national health spending. These patients typically see multiple clinicians at different locations, making care coordination imperative.

A Commonwealth Fund survey in 2011 focused on patients with high care needs in 11 countries. The survey showed that all countries are facing similar challenges in providing effective care to sicker adults, contending with coordination gaps, lapses in communication between providers, and missed opportunities for engaging patients in the management of their own care. For instance, 56% of patients in Germany reported that they "experienced coordination gaps" over the last two years. Test results / records were not available at time of appointment, doctors ordered tests that had already been done, providers failed to share important information with each other, specialists did not have information about the patient's medical history, and/or the General Practitioner was not informed about specialist care. In Germany and France, 47% patients "did not have arrangements made for follow-up visits" after hospital discharge. The authors concluded that there is a clear need in all countries for improvement in coordinating care for patients with complex conditions. Necessary measures include redesigning primary care, developing care teams accountable across sites of care, and managing transitions and medications.

If poorly managed, chronic diseases can currently account for as much as 70% of health expenditure, partly because of the significant costs involved in employing a workforce to care for sick older people. The costs to governments could be higher still, were it not for the millions of informal carers. This situation is unsustainable when considering the impact of the demographic changes.

In the scope of CareWell, care coordination and home support services have been proposed for that share of the population with complex conditions, in particular, the sickest 5% with multiple pathologies.

Table of Contents

EXECUTIVE SUMMARY	3
TABLE OF CONTENTS	4
1. INTRODUCTION	6
1.1 Purpose of the deliverable	6
1.2 Structure of this deliverable	6
1.3 Glossary	6
2. SUMMARY DESCRIPTION OF PROJECT CONTEXT AND OBJECTIVES	7
2.1 Context	7
2.2 How CareWell addressed its objectives	7
3. PAVING THE WAY TOWARDS CAREWELL PATHWAY DESIGN	10
3.1 Background	10
3.2 Main results	10
3.3 Referenced deliverables and milestones	11
3.4 Lessons learned report	12
3.5 Recommendations	12
4. IMPLEMENTING CAREWELL INTEGRATED SYSTEM	13
4.1 Background	13
4.2 Main results	13
4.3 Referenced deliverables and milestones	15
4.4 Lessons learned report	15
4.5 Recommendations	16
5. PAVING THE WAY TOWARDS CAREWELL ECARE IMPLEMENTATION	17
5.1 Background	17
5.2 Main results	17
5.3 Referenced deliverables and milestones	17
5.4 Lessons learned report	18
5.5 Recommendations	18
6. HAS INTEGRATED ECARE KEPT ITS PROMISE? RESULTS FROM CAREWELL	19
6.1 Background	19

6.2	Main results	20
6.3	Referenced deliverables and milestones	22
6.4	Lessons learned report	22
6.5	Recommendations	23
7.	PLANTING THE SEED FOR THE FUTURE CAREWELL ESERVICES DEPLOYMENT	24
7.1	Background	24
7.2	Main results	24
7.3	Referenced deliverables and milestones	25
7.4	Lessons learned report	26
7.5	Recommendations	27
8.	ADDRESS OF THE PROJECT PUBLIC WEBSITE AND RELEVANT CONTACT DETAILS	28
8.1	Project website & logo	28
8.2	Pilot sites	28
8.3	Other partners	29
8.4	Advisory Boards *	29



1. INTRODUCTION

1.1 Purpose of the deliverable

The Final Report is the CareWell project's closing report. It is intended for an external audience to gain an overview of the project objectives, activities and results. The report summarises the key aspects of the project, and directs readers to appropriate project material for more in-depth information.

1.2 Structure of this deliverable

Section 2 presents a summary of project context and objectives.

In sections 3 to 7, the main achievements of the project are reported, with a brief description of the main activities and results. Further details are reported in the referenced deliverable documents, which can be found on the project website: <http://www.carewell-project.eu/home.html>. Deliverables and milestone descriptions are listed.

Section 8 gives details of all the participants in the CareWell project.

1.3 Glossary

ICT Information and Communication Technology



2. Summary description of project context and objectives

2.1 Context

Patients with complex care needs are known to account for a disproportionate share of national health spending. These patients typically see multiple clinicians at different locations, making care coordination imperative.

A Commonwealth Fund survey in 2011 focused on patients with high care needs in 11 countries. The survey showed that all countries are facing similar challenges in providing effective care to sicker adults, contending with coordination gaps, lapses in communication between providers, and missed opportunities for engaging patients in the management of their own care. For instance, 56% of patients in Germany reported that they "experienced coordination gaps" over the last two years. Test results / records were not available at time of appointment, doctors ordered tests that had already been done, providers failed to share important information with each other, specialists did not have information about the patient's medical history, and/or the General Practitioner was not informed about specialist care. In Germany and France, 47% patients "did not have arrangements made for follow-up visits" after hospital discharge. The authors concluded that there is a clear need for all countries to improve coordination of care for patients with complex conditions. Necessary measures include redesigning primary care, developing care teams accountable across sites of care, and managing transitions and medications.

If poorly managed, chronic diseases can currently account for as much as 70% of health expenditure, partly because of the significant costs involved in employing a workforce to care for sick older people. The costs to governments could be higher still, were it not for the millions of informal carers. This situation is unsustainable when considering the impact of demographic changes.

In the scope of CareWell, care coordination and home support services are proposed for the proportion of the population with complex conditions, in particular, the sickest 5% with multiple pathologies.

Complex and multi-morbid patients, due to their multifactorial health condition, require a personalised and coordinated care approach with an "integrated vision of the patient" at all levels of care (primary, specialised, medium stay, mental health, emergencies, social services, health at work, etc.).

CareWell focuses on complex, elderly multi-morbid patients; services are seamlessly organised around patient needs rather than hand-over (real-time communication support, integrated care records, etc.) and how ICT tools can improve the delivery of care for these patients in an integrated care pathway. The two services proposed, underpinned by care pathways, are:

- Care coordination and communication services with a focus on inter-professional coordination.
- Patient-centred home support and empowerment services.

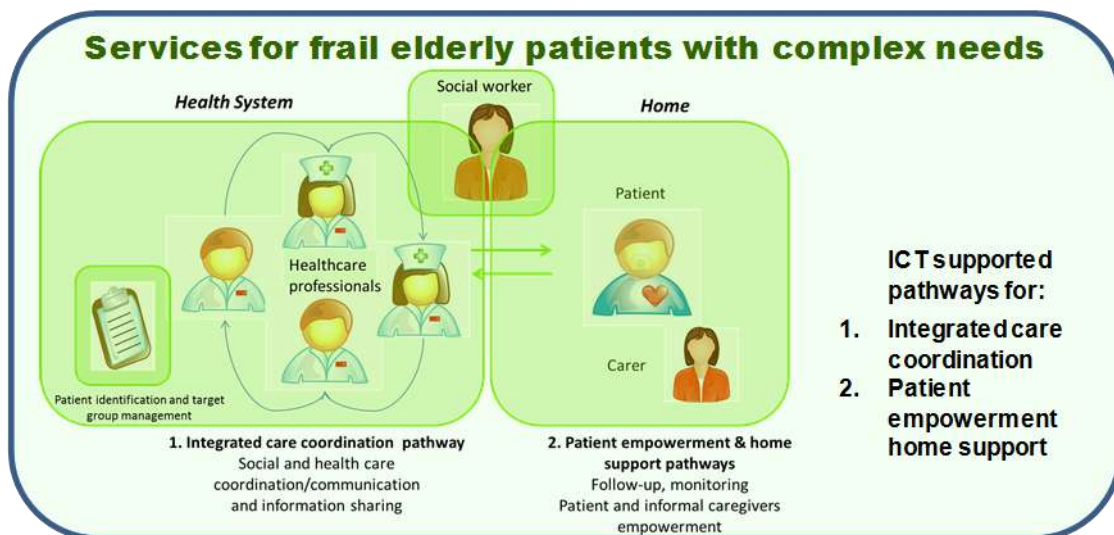
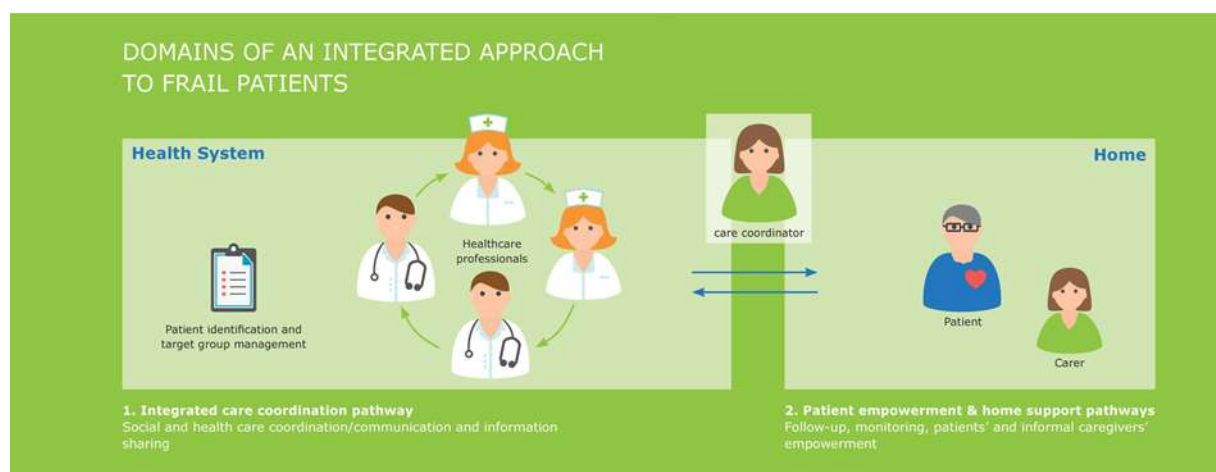
2.2 How CareWell addressed its objectives

CareWell enables the delivery of integrated healthcare to frail elderly patients through comprehensive multidisciplinary programmes. ICTs facilitate the coordination and communication of healthcare professionals, and support patient centred delivery of care at home. The project supports the integration of care in six European Regions.

CareWell has focused on the provision of care and support to older people who have complex health and social care needs, are at high risk of hospital or care home admission, and require a range of high level of interventions due to their frailty and multiple chronic diseases. This has been achieved through ICT enabled coordination and monitoring of healthcare services, patients' self-management, and informal care givers' involvement. The ICT platforms and communication channels have avoided duplication of effort when dealing with patients' diagnostic, therapeutic, rehabilitation, or monitoring and support needs. Additionally, ICT-based platforms improved treatment compliance, enhanced self-care and self-management, and increased patient and carer awareness of their health status; all of which improved clinical outcomes and enabled people to lead fulfilled lives. In addition, technologies supported the patients' informal caregivers, highlighting when respite care or additional professional input was required.

The CareWell services are based on two pathways supported by ICT:

- integrated care coordination; and
- patient empowerment & home support.



These care pathways cut across organisational boundaries, and ensure that healthcare resources are more efficiently and effectively used. Information sharing complies with European and national regulations relating to consent and privacy. The ICT platform is based, wherever possible, on open standards and multi-vendor interoperability; collaboration among ICT suppliers is strongly encouraged.

The CareWell Consortium comprises six deployment sites in the following regions:

- Basque Country (ES)
- ARes Puglia (IT)

- Veneto (IT)
- Zagreb (CR)
- Lower Silesia (PO)
- Powys (UK)

The Region of Syddanmark developed the evaluation protocol for the sites, which is based on the MAST methodology for the evaluation of complex interventions. Osakidetza and Kronikgune have been responsible for the quantitative and qualitative assessment of the results and the predictive modelling approach.

The research, development and deployment of ICT tools have been supported by partners Osakidetza, Ericsson Nikola Tesla, and Sveuciliste u Zagrebu Fakultet Elektrotehnike I Racunarstva.

The learning and exploitation of results have been supported by the International Foundation for Integrated Care (IFIC), who also led the Integrated Care Glossary and CareWell Guidelines tasks. Finally, the Consortium includes two leading consultancies specialised in the eHealth and eInclusion fields, namely empirica and Health Information Management SA, the former supporting the user requirements, dissemination and exploitation activities, and the latter through their expertise in change management, process re-engineering, project management, quality assurance, medical co-ordination, and data privacy and ethics.

The high level policy and strategic objectives of the CareWell service are to:

- Optimise the efficiency and the effectiveness of the healthcare services delivered to complex multi-morbid patients aged 65+ through the use of integrated care programmes.
- Contribute to the long-term sustainability of regional healthcare systems in Europe.
- Provide evidence for a replicable plan for the pan-European deployment of integrated care services.
- Create a critical mass for the large scale, European-wide deployment of ICT-enabled integrated service models, relying on the support of public entities and their capabilities to achieve EU-wide operation of a commonly defined ICT integration infrastructure.
- Provide a forum for innovative European ICT industries to showcase their services that support integrated care delivery solutions.
- Create an approach to deliver integrated care for complex multi-morbid patients aged 65+ that can be transferred to other cohorts of the population with other health and social care needs.

CareWell specific and measurable objectives are grouped into three domains:

- Service specification, testing and deployment.
- Business development, evaluation and exploitation.
- Outreach and dissemination.

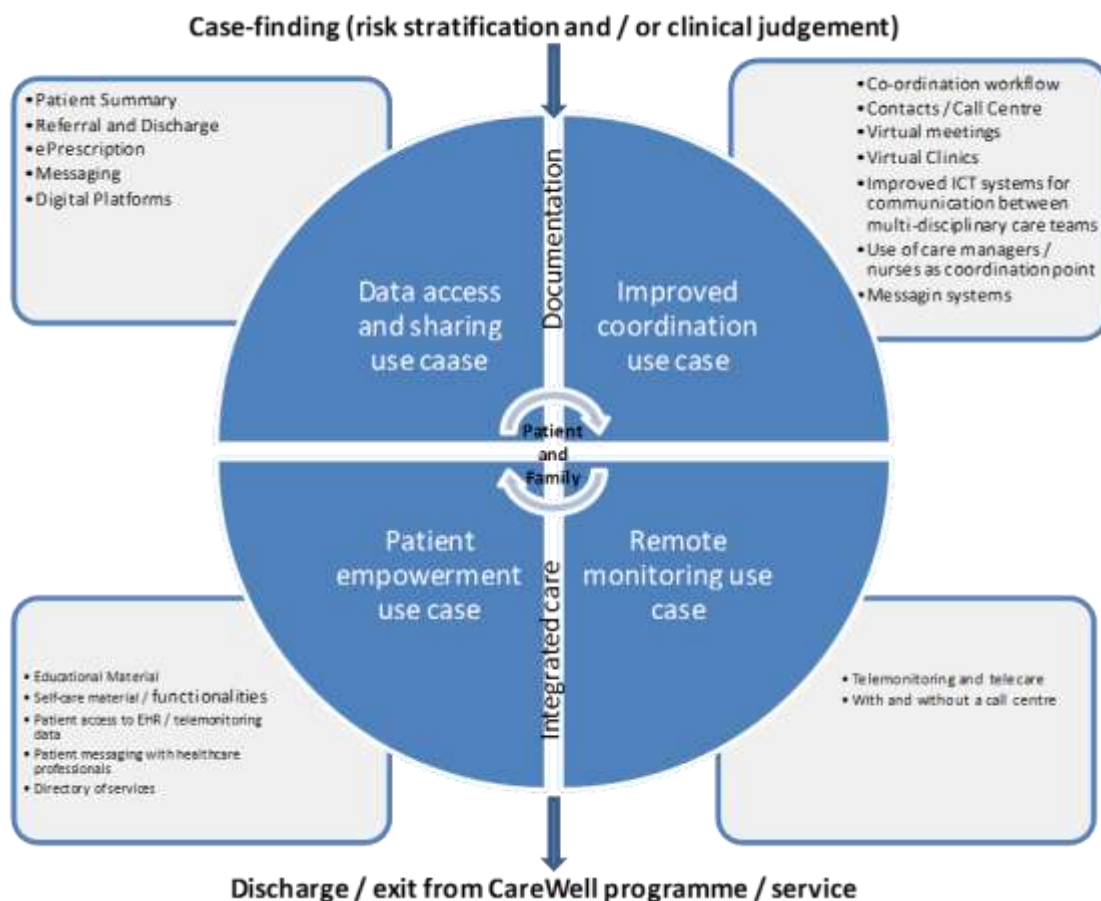
3. Paving the way towards CareWell pathway design

3.1 Background

CareWell services aim to improve integration of care for patients with complex needs; specifically through better data access and sharing, improved coordination of healthcare professionals, remote monitoring of patients, and patient empowerment. In order to ensure that CareWell services are fit for purpose and meet expected goals, users' (patients, caregivers, and professionals) requirements were captured, collated and documented. Based on the requirements, use cases were described in each site which outlined the care process and areas of healthcare delivery in which a need for improvement has been identified. Use cases then acted as building blocks to depict organisational models and care pathways to be deployed in the implementation phase.

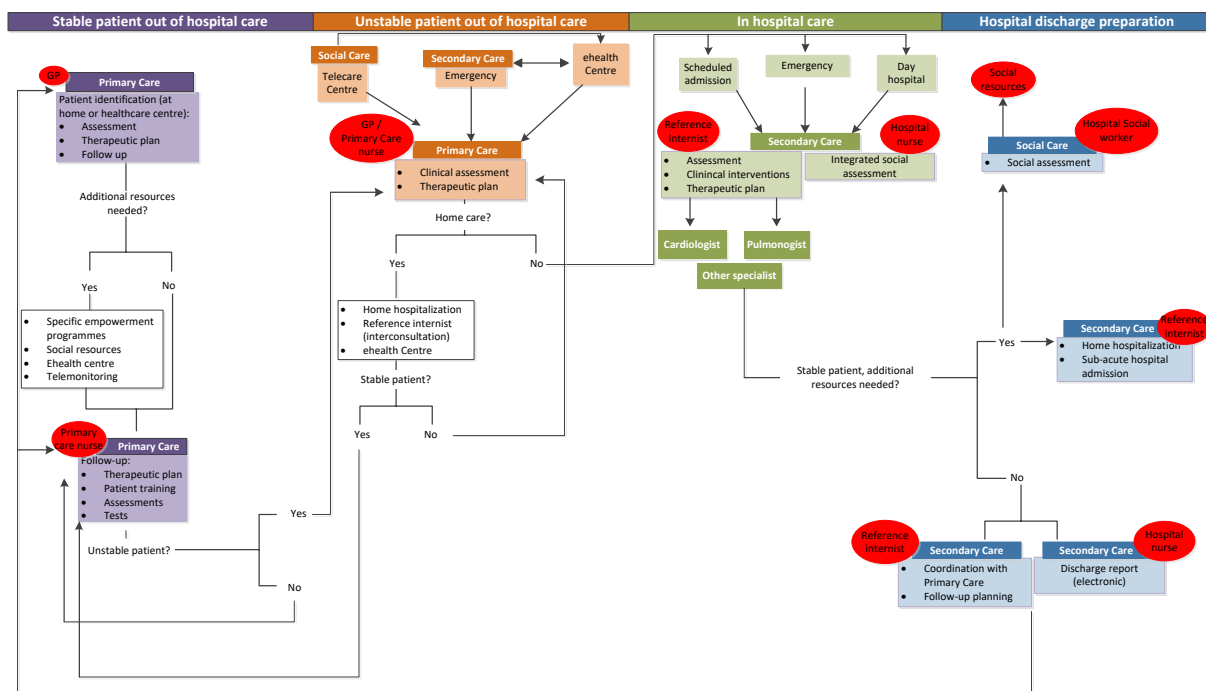
3.2 Main results

Use cases were built according to the requirements specified by users on legal, financial, organisational and technical aspects. Use cases gathered initial information from the six CareWell sites on how they would improve their service delivery, and served as a first step in a longer journey of designing and delivering CareWell services. Use cases defined the purpose of the services, the four domains they encompassed (data access and sharing, improved coordination, patient empowerment and remote monitoring), the scale of these services' delivery, the context in which they were delivered, their content, the participants who used the service, and the improvements and benefits that the service brought. The four domains, or functional blocks, and the potential actions in each of them are seen in the figure below.



Having the use cases defined, each site then described the existing organisational model and the CareWell integrated care pathway. The models represent who is involved in the care process, what kind of activities these actors perform, and the communication channels or ICT tools used. The pathways illustrate a frail elderly patient's journey through the healthcare system. Sites progressed from the starting point of analysing their existing models, to the identification of their improvement areas, and finally to define the incorporation of the new services and ways of working into the pathways to be implemented. Both the organisational models and care pathways were visually organised in four stages according to the patient's health status: (1) stable patient out of hospital care; (2) unstable patient out of hospital care; (3) in hospital care and (4) hospital discharge preparation.

Below is the example of the CareWell integrated care pathway of the Basque Country.



3.3 Referenced deliverables and milestones

Deliverables listed below can be found on CareWell project website.

Deliverable no.	WP no.	Deliverable name	Lead Beneficiary
D1.7	1	Ethics and Data Protection Framework	HIM
D2.1	2	Requirements for CareWell integrated care models and pathways.	empirica
D2.2	2	Requirements for CareWell integrated care models and pathways.	empirica
D3.1	3	CareWell organisational and service process models	Kronikune

Milestone	WP no.	Milestone name	Lead Beneficiary
MS1		User requirements	empirica

3.4 Lessons learned report

Things that went well

- In-depth exploration of users' requirements ensured that CareWell services met their needs and expectations.
- The methodology used to analyse the existing organisational models, detect improvement areas, and define specific interventions to reach better outcomes in CareWell services was successful.
- Close and intense collaboration among stakeholders in each site to design and deliver the CareWell services.

Things that could have gone better

- End user's (patients and caregivers) perspective has to be taken into account, not only in the requirements collection phase, but also during integrated care pathway design.

Things that surprised us

- There is significant heterogeneity between the existing organisational models of the CareWell sites: number of stakeholders, type of interaction between these people, functions, and the communication channels used. However, important common elements have been identified: primary care professionals are responsible for case management when the patient is stable, while social workers are in charge of scheduling home visits to perform distinct social care interventions. Once a patient becomes unstable, but is still out of hospital care, the GP with or without GP nurse defines the therapeutic care plan, follows up the patient's health status, and refers to specialists if necessary.

Lessons learned

- The development of an ICT service on its own is not sufficient for change
- Multidisciplinary teams representing all stakeholders are crucial to take into account their needs and expectations when defining the organisational models and pathways.
- New care pathways have to be integrated into the routine practice of the professionals, so that it does not require an extra effort, but a reorganisation of the daily tasks.
- Professionals have to be trained in the use of new technologies, and have to be supported to develop new skills to ensure proper up-take and use of services.
- Involvement of the decision makers of healthcare organisations is essential to encourage front-line professionals to adopt new working procedures.

3.5 Recommendations

- **Recommendation 1:** Intense commitment of decision makers in the implementation of new services is crucial to boost healthcare professionals' engagement.
- **Recommendation 2:** Consider the patient's and caregiver's perspective; this enables the design and deployment of real patient-centred care pathways.
- **Recommendation 3:** Need to reorganise existing resource and define new roles, rather than make significant investments in hiring new staff.

4. Implementing CareWell integrated system

4.1 Background

The organisational models and care pathways developed were built on specific technological infrastructures forming the CareWell services in each site according to their particular technical requirements. The service models have been enhanced through the implementation of both new and improved ICTs, and associated new ways of working in each of the care settings. The resulting service prototype was tested in each site before the deployment phase. The testing procedure was based on concrete protocols and required engaging end users in the simulation and use of distinct platforms and devices.

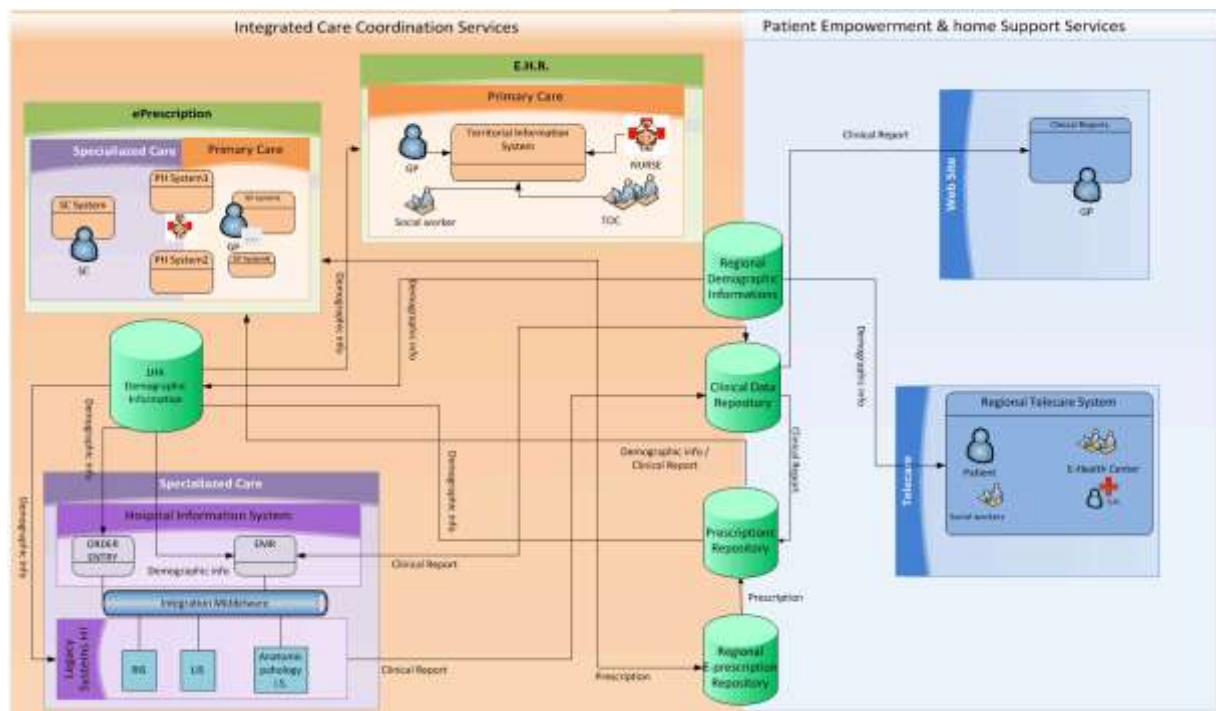
4.2 Main results

Existing ICT-enabled service specification and ICT architectures were mapped, together with those which were then implemented in each site to support the deployment of the care pathways. It was important to analyse and document the applications or systems running before the start of CareWell for a better understanding of the impact of new applications or services. Additionally features of each application and user role were summarised.

Both the existing technological models and the enhanced ICT-based architecture were illustrated using a common CareWell architecture and the interoperability / security guidelines.

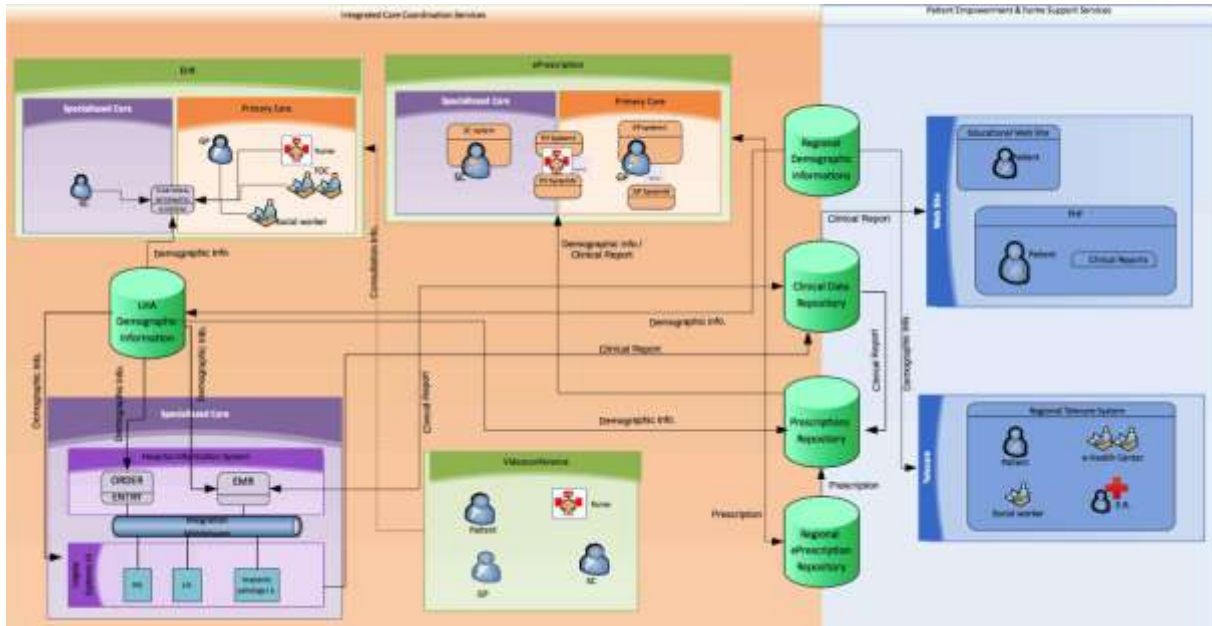
By graphically representing the existing architecture and the enhanced-ICT model, it was easy to identify the technological improvements made in each site.

The existing architecture of Veneto pilot site is shown below as an example.



Once the CareWell enhanced ICT-facilitated services were implemented, the architecture of the services varied significantly.

The following figure presents the CareWell architecture for the Veneto region.



In addition to the representation of the architectures, how the existing ICT-enabled services moved towards CareWell services was described. Not only was the absence or presence of the services specified, but the shift of the maturity level was also determined.

The following table summarises the example of Veneto region.

Veneto	Before		After	
	Operational	Maturity level	Operational	Maturity level
e-prescription	YES	5	YES	5
Messaging clinician ↔ Patients	NO	0	NO	0
EHR	YES	1	YES	4
Interconsultation	NO	0	YES	4
Call Centre	NO	0	YES	3
Virtual Conference	NO	0	YES	4
PHR	NO	0	YES	3
Nurse Information System (record of nursing care)	NO	0	NO	0
Educational Platform	NO	0	YES	4
Collaborative Platform	NO	0	NO	0
Telemonitoring	NO	0	YES	4
Multichannel Centre (Management Telecare Programs)	YES	5	YES	5

Once the organisational models and integrated care pathways were defined, together with the technological infrastructures and service specifications, the testing procedures of prototypes were carried out before the operational phase.

The methodology used was inspired by the Service Design concept, which is the activity of planning and organising people, infrastructure, and communication and material components of a service in order to improve its quality and the interaction between

service provider and customers. Based on this idea, the testing methodology included: (1) definition of the prototype; (2) description of the expectations; (3) experiences; (4) analysis of results; (5) satisfaction / dissatisfaction assessment; (6) application of corrective actions; and (7) implementation of the service.



The six CareWell sites followed this methodology for each of the services to be implemented in the operational phase. This approach ensured that all services were tested and fine-tuned before the field trial started, facilitating a successful implementation.

4.3 Referenced deliverables and milestones

Deliverables listed below can be found on CareWell project website.

Deliverable no.	WP no.	Deliverable name	Lead Beneficiary
D4.1	4	Pilot level Service Specification for CareWell services	Osakidetza
D5.1	5	The CareWell prototype system	Kronikgune

4.4 Lessons learned report

Things that went well

- The definition of a common CareWell ICT architecture which illustrated the relationship between applications and the systems implemented; this enabled the comparison between pilot sites.
- Representing the existing architecture allowed sites to identify gaps and define the new services required, taking into account budgetary and time constraints.
- Tracking of service evolution facilitated the representation of how CareWell impacted on maturity level of service.

Things that could have gone better

- The execution of the testing procedure was harder, and took longer than expected, since numerous stakeholders needed to be involved, and platforms / devices were not available when needed.



Things that surprised us

- To guarantee data security is more complex than expected; a balance between data sharing and data protection is crucial.
- The most relevant services required to achieve integrated service delivery are: Electronic Health Record (EHR), Personal Health Record (PHR) and ePrescription.

Lessons learned

- ICTs are not sufficient to achieve service integration; achieving interoperability at three levels (semantic, syntactic and business process) is also required.
- The CareWell ICT architecture can be adapted to any technology addressed to integrated healthcare services. This is due to the independence between the architecture and the following elements: interoperability standards, programming language, data storage technology, and operating systems.
- Application of a rigorous testing procedure, which includes the definition of the prototype, the collection of the experience of users, the analysis of results, and the application of corrective actions if needed, minimises the failure possibilities during the operational phase.

4.5 Recommendations

- **Recommendation 1:** A global architecture has to consider the requirements of all stakeholders, including functional (healthcare professionals and managers) and technological teams, in order to be: usable, efficient, sustainable and robust.

5. Paving the way towards CareWell eCare implementation

5.1 Background

ARes Puglia had the responsibility to lead WP6, and therefore to coordinate and coach the operational roll-out in the six regions involved in the project.

In order to do so, Puglia, together with the other partners, thought that it was sensible to share an outline to support sites in the definition of the local workplan for deployment.

The aim of the local operational plan template was to build a tool for sites, to make possible the standardisation of site operation in all six regions, guaranteeing the collection of the data necessary to carry out the assessment process envisaged in WP7 (Evidence gathering and evaluation report).

This guidance aimed to ensure a homogeneous development of every phase of the operational plan development across the six sites, under HIM SA oversight, liaising with each task leader who managed the specific tasks across the six sites, collecting and transferring issues from each phase to ARes Puglia, responsible of coaching.

5.2 Main results

All sites successfully completed the project. The roll-out of the integrated model with introduction of ICT support services represented the “core” of the project. Without the six completed operational plans, it would not have been possible to successfully achieve the project results. Each region did its best to overcome hurdles and issues. All sites reported problems and solutions in an online tool, RAIL tool, specifically created to support sites in the traceability of activities and issues. This tool facilitated creating a list of lessons learnt and suggestions to be shared among partners, and similarly to support other European regions that wish to introduce integrated models and remote monitoring to deliver care to chronic patients.

The qualitative analysis of data, carried out in addition to quantitative analysis, reported a very positive feedback from policy makers, professionals, patients and caregivers. They all agreed on the positive impact that technology has in the improvement of integrated service delivery for chronic patients.

Despite the six different contexts, the nine domains identified for the site operational plans were demonstrated to be strategic in planning full scale deployment of integrated care and remote monitoring of chronic patients.

In particular, patient empowerment turned out to be a very relevant key enabler in all sites. In fact, all sites worked really hard to introduce and/or or improve methodologies to empower patients, using different strategies and sharing common grounds of interventions.

5.3 Referenced deliverables and milestones

Deliverables listed below can be found on CareWell project website.

Deliverable no.	WP no.	Deliverable name	Lead Beneficiary
D6.1	6	CareWell pilot sites operational	Ares Puglia
D6.2	6	Report on operation of pilots	Ares Puglia



Milestone	WP no.	Milestone name	Lead Beneficiary
MS3	6	Pilots activation	Ares Puglia

5.4 Lessons learned report

Things that went well

- All sites guaranteed respect for time and tasks with a great collaboration spirit, helping each other and sharing experiences.

Things that could have gone better

- Procurement methodologies for acquisition of ICT support services and devices.

Things that surprised us

- The strong interest shown in the RAIL tool by Commission and reviewers, and their full involvement and support for it, which has facilitated the achievement of the project results.

Lessons learned

- Team work among partners, among policy makers, among political institutions is important to make a project concrete and useful as a step forward in introducing innovation processes.
- Involvement of policy makers is fundamental to guarantee successful deployment of innovative models to deliver care.
- Patient empowerment is the key enabler to successfully introduce technology and promote health innovation processes.
- To carry out trials, it is important to foresee longer timeframes in planning a project. That gives more time for further analysis and in-depth conclusions.
- Carrying out trials in six Regions representing six contexts so different in terms of geographical position, political and economic background, and maturity of healthcare settings, brought added value to the project overall outcomes; and is therefore recommended.
- The deployment of the CareWell service in each site would have benefited from having additional time in the design and planning stages to undertake further stakeholder engagement, involvement, and ICT alignment, development, and testing activities.

5.5 Recommendations

- **Recommendation 1:** Important to set up easy to manage tool to collect everyday operational issues from start of project and monitor this throughout project to mitigate risks, and also as support in coaching and learning from each other.
- **Recommendation 2:** For EU supported projects, try to ensure collaboration with representative of EC, and work as a team for the achievement of best results in implementing projects and use of European funds.
- **Recommendation 3:** Projects that demonstrate particular success in targeting issues relevant for the community and for the achievement of EU objectives should be endorsed and undergo a more flexible management of timeframe and financial management.

6. Has integrated eCare kept its promise? Results from CareWell

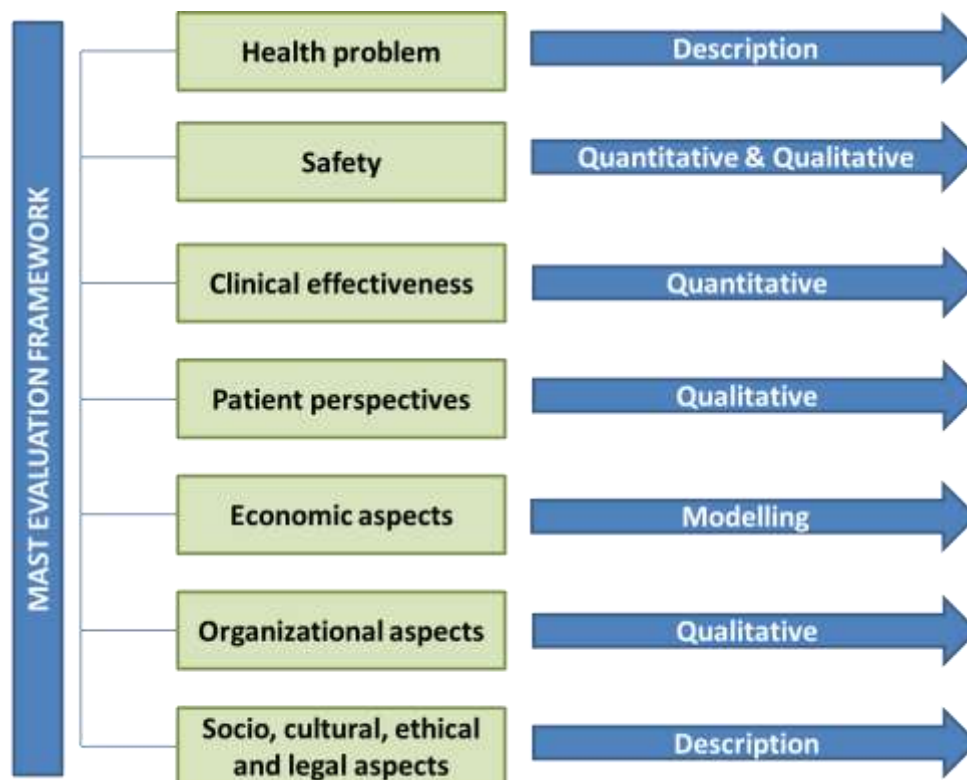
6.1 Background

CareWell has focused on the provision of care and support to frail elderly patients through ICT enabled healthcare services which aim to improve coordination and monitoring, patients' self-management, and informal care givers' involvement.

The assessment of the impact of CareWell services has been conducted using the MAST multi-dimensional evaluation methodology adapted to the needs of the project, focusing on integrated healthcare. MAST includes assessment of the outcomes of telemedicine applications divided into the following seven domains:

- 1) Health problem and characteristics of the application.
- 2) Safety.
- 3) Clinical effectiveness.
- 4) Patient perspectives.
- 5) Economic aspects.
- 6) Organisational aspects.
- 7) Socio-cultural, ethical and legal aspects.

Each of these domains has been tackled using the most appropriate methodological approach, as presented in the following figure.



Considering the complexities of the intervention, the description of these domains allows for the comprehensive assessment of the intervention, the framework in which it has been deployed, the process for its implementation, as well as its health, organisational and economic impact.

In order to assess each of the proposed domains, a mixed methodology approach was used. These are the three methodological techniques used:

- Quantitative study (pre-post analysis, and intervention group vs control group).
- Qualitative study (semi-structured interviews).

6.2 Main results

Around 850 patients were recruited in the six CareWell sites. Participants fulfilled the following inclusion criteria:

- Age ≥ 65 years.
- Presence of at least two chronic diseases included in the Charlson Comorbidity Index. At least one of the comorbid conditions was one of the following: chronic obstructive pulmonary disease (COPD), diabetes mellitus (both insulin-dependent and noninsulin-dependent) or chronic heart failure (CHF).
- Fulfilling local / national / organisational criteria of frailty: increased vulnerability, complex health needs, and at high risk of hospital or care home admission.
- Participants have to be able to understand and to comply with study instructions and requirement, either independently or with help from a carer.

The main results are summarised below:

- **Health problem and characteristics of the application**

A growing share of the population in OECD countries is aged 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.

Studied patients are characterised by having complex health and social care needs, being at risk of hospital or residential care home admission, and requiring a range of high level interventions due to their multiple chronic conditions.

- **Safety**

Safety has been assessed by considering the incidence of mortality during the follow up period, as well as other issues related to the incorporation of new technologies and a new patient-professional framework.

Although the death rate is high (7.1%) as expected in patients with a high degree of morbidity and complexity, there were no significant differences between the intervention and comparator groups, so the CareWell services did not raise any safety concerns.

When new technologies were included in the care model, patients and carers did not encounter any risks regarding safety, but professionals indicated that patients' data were less controllable, and sometimes the tools were unreliable, so they had less confidence in the results that were obtained by means of such tools.

- **Clinical effectiveness**

Some indicators (Body Mass Index, oxygen saturation and blood glucose) showed a significant reduction in the intervention group from baseline to the end of the follow up period. These changes are not observed in the comparator group, in which they stayed steady. Nevertheless, when the changes observed in the two groups were adjusted and compared for confounding factors, the observed differences are not statistically significant.

There is a change in the profile of services / resources used by these citizens. Even though the number of hospitalisations does not show any differences, the length of stay among those who have been hospitalised is shorter in the intervention group, as well as the number of visits to ER services, also lower in the intervention group.

The number of visits to GP and primary care nurses increased for the intervention group, but this difference loses its statistical significance when adjusted. No differences were observed when social services are considered.

- **Patient perspectives**

In order to assess patients' perception, two approaches have been used: PIRU questionnaire on user experiences of integrated care, and semi-structured interviews with patients and caregivers.

Overall, improvements can be found in both the intervention and comparator group. Studied subjects tended to believe that their needs have been better assessed at the end of follow up, they felt that they and their families are much more involved in both their care process, and the decision making process. In addition, they considered that the level of support they received from health and social institutions improved, and that they were better informed about their care plan.

These care recipients perceived that their professionals work together in a coordinated way, and the work of nurses has been mentioned to be especially helpful for them. Also, a more intense communication with healthcare professionals has been mentioned. This involvement in their healthcare, and the perception that professionals have been taking closer care of them, made patients feel more aware of their health, and more secure and protected. So, we could say that CareWell works for the empowerment of patients.

- **Economic aspects**

The economic aspects have been investigated through two types of approaches: cost-benefit analysis (ASSIST) and predictive modelling.

The results from the cost-benefit analysis of the six sites shows that in many sites the tools and services implemented are to the benefit of patients, though the savings in terms of shorter hospitalisations are cost-beneficial in only some sites. More details can be found in next chapter 7.

The predictive modelling assessed the implementation of integrated care for multi-morbid patients at population level, and allowed testing of how the budget would change if different objectives are achieved.

- **Organisational aspects**

Organisational aspects have been mostly covered by qualitative data analysis. Professionals from all sites point out that after the deployment of CareWell, the coordination and communication among professional has clearly improved, and so has the work process and the use of services; although some sites pointed out that they were already working closely in the management of this profile of patients. This way of working in coordination between the different care levels helps professionals to learn from each other.

- **Socio-cultural, ethical and legal aspects**

Concerning ethical issues, all sites remarked that an informed consent form was provided to patients, and the intervention was evaluated and approved by local ethical committees before implementation started.

With respect to legal issues, healthcare professionals had the credentials required to access the ICT tools needed to provide the CareWell care model. All professionals participating in the intervention were accredited by their respective healthcare system. Additionally, the medical devices used complied with standards, and the health-related data were securely registered.

In terms of social aspects, both healthcare professionals and patients showed satisfaction with the new care model; they feel more comfortable and better assisted, respectively.

6.3 Referenced deliverables and milestones

Deliverables listed below can be found on CareWell project website.

Deliverable no.	WP no.	Deliverable name	Lead Beneficiary
D7.1	7	CareWell Evaluation Framework	RSD
D7.2	7	Interim evaluation report	Kronikgune
D7.3	7	CareWell pilot outcomes	Kronikgune
D8.1	8	First report on dissemination and exploitation activities	empirica
D8.2A	8	Interim report on exploitation activities	empirica
D8.4	8	Deployment plans for CareWell	empirica

Milestone	WP no.	Milestone name	Lead Beneficiary
MS2	7	Evaluation framework	RSD
MS4	8	Deployment plans	empirica

6.4 Lessons learned report

Things that went well

- The battery of indicators defined was adequate to analyse the seven dimensions of the MAST framework in depth.
- The number of interviews done in the qualitative study gave us the opportunity to reach saturation point of the data, which led to some findings applicable to all the participating sites.
- The qualitative analyses have been performed triangulating the data with different stakeholders (end users, caregivers, professionals and managers), strengthening the validity of the results.
- Having a big target population sample let us carry out subgroup analysis, which gave key insights on who were the “real” beneficiaries of the intervention in the Basque Country.
- The use of the predictive modelling allowed as studying the burden of the disease under different scenarios.

Things that could have gone better

- Combining qualitative techniques before starting the implementation of the care model and after it could have given us more information on the changes that this new care model has been able to make, from the point of view of every stakeholder.
- It was hard to identify key clinical variables which indicated the severity of the patients.
- Setting objectives in the planning stage is really important in order to evaluate policies. We set objectives retrospectively.

Things that surprised us

- The reduction in days hospitalised was greater than the reduction in risk of hospitalisation.

Lessons learned

- This new care model has been able to strengthen the coordination between care levels, and also between end users / caregivers and professionals.
- Planning the evaluation procedures at the beginning of the study helps to allocate the resources (money, time, personnel...) throughout the whole process, so that each site can organise the tasks to be done.
- Using real-world data provides an effective and efficient design to evaluate integrated care programmes.
- Resource consumption has to be adjusted by follow-up, because if survival is longer, so is the resource consumption.
- The use of ICT resources in the management of chronic diseases has not been evaluated, as the included patients are quite old, and they are not used to using them. A change in the inclusion criteria of patients, lowering the age range, could help overcome this issue.
- The qualitative methodology can help understanding the way of thinking of the participants, their experience with this new care model, and the organisation of the health assistance itself, identifying those areas that would need some improvements in the care of chronic patients.
- The qualitative study has complemented the information obtained by other methods, mainly quantitative, all of them employed for the evaluation of the CareWell implementation. This mixed-methods approach has contributed to obtaining a more holistic and generalisable picture of the health processes involved in the care of these patients.
- When building a predictive model, it is important to distinguish the incident cohort from the prevalent cohort, since there is a vast number of individuals who do not have contacts with a particular resource, and many other that have several.

6.5 Recommendations

- **Recommendation 1:** Set objectives.
- **Recommendation 2:** Both top down and bottom up approaches are necessary to achieve an actual implementation of integrated programmes.



7. Planting the seed for the future CareWell eServices deployment

7.1 Background

Exploitation in CareWell aimed to make integrated care services:

- Viable: working successfully.
- Sustainable: maintaining a positive ratio of costs and benefits.
- Scalable: working for all care recipients meeting the eligibility criteria and not only the pilot population. Furthermore, the transferability of the care model to other frail, older people living with different combinations of chronic conditions.

Focusing on a service instead of a product has several consequences for deployment planning. It puts an emphasis on the implementation environment, the organisational change, and workforce requirements, and their impact on service delivery, as well as on the task of optimising the service configuration to work in the given environment. Market aspects such as a competitor analysis are less relevant, because a decision to use products within the service has already been taken.

The tasks in WP8 on exploitation and deployment planning support were therefore primarily designed to support the individual deployment regions in shaping an optimal service configuration under given local circumstances. In that sense, work was primarily directed towards formative value case modelling in a given multi-stakeholder service environment, rather than an ex-post evaluation of the service under field conditions. The approach adopted for this purpose, called ASSIST, has been developed and applied by empirica in several EC funded projects². The final output of this work is evidence based deployment plans for all regions that are presented in deliverable D8.4, chapter 3.

Another important aspect of exploitation planning is the European dimension which extends beyond the immediate deployment in the project's pilot regions. CareWell developed guidelines to address some of the key aspects of deploying integrated healthcare services incorporating an ICT component. The guidance was based on what the evidence-base indicates are the key building blocks for successful delivery of integrated healthcare services and the experience of the CareWell sites.

7.2 Main results

The deployment plans of the sites include the up-scaling of services to larger patient and staff groups, securing continuous funding, and recognising the relevant framework programmes or documents. The up-scaling potential varies from 1,500 – 14,000 patients with 51 – 3,500 health professionals, and depends on the local comprehensiveness of services. All regions have defined the policy framework programmes or documents in which they deploy the new services. Additionally, they considered possible funding sources for the further service deployment which include, but are not limited to, national and regional health service budgets, health insurance reimbursements, and additional European projects (Table 1).

² Hammerschmidt and Meyer (2014)

Table 1: Overview of deployment plans

	Basque Country	Lower Silesia	Puglia	Veneto	Powys	Zagreb
Patients	5,200	3,000	2,748	2,072	14,334	1,500
Staff	3,547 (GPs, hospital physicians, paramedics, nurses, social workers,	Up-scaling not yet determined	384 (GPs, care managers, district specialists, clinical engineers and biomedical technicians)	114 (GPs, home care nurses, hospital physicians and nurses, social care workers)	51 (all 17 community practices with 17 GPs and 34 nurses and practice manager)	196 (GP, hospital cardiologist and nurses, field nurses)
Policy documents	Strategy on Chronicity; Health Plan 2013 – 2020; Strategic Guidelines 2013-2016	The Operational Programme of Digital Poland for 2014-2020	Regional Operational Plan 2014-2020	Regional Care Management Program for chronic patients; New framework of the Integrated GPs practice		Possibly the action plan for prevention and control of non-communicable chronic diseases at the Ministry of Healthcare
Funding for up-scaling	4M€ from Health Policy for the Basque Country 2013-2020 funds; The European project ACT@Scale	915K€ per year for the framework programme. It is unclear if it can be used for CareWell telecare services.	No regional budget allocated yet. The regional Health Authority, Foggia LHA, considers funding a similar approach to CareWell.	Veneto will try to draw up-scaling budget from the annual budget of the LHAs	Funding through National “Efficiency Through Technology” and further EU funding is considered	Funding not yet secured. Possibly through health centre budget for medical devices and reimbursement by health insurance through fee for services.

Main outcomes of the cost-benefit analysis

All deployment regions have carefully considered which stakeholders and indicators should be included in the ASSIST tool, on which the cost-benefit analysis is based. The results have shown that the patient groups in all deployment regions value the new services positively in terms of resources spent and benefits received from the services, as well as overall service satisfaction.

With regard to the overall cumulative socio-economic return (SER), the six deployment regions vary considerably, some having a positive and some a negative SER. In some sites, it was found that more accurate diagnosis and monitoring led to increased hospital admissions, and not less, as initially hoped for. In some cases, additional accuracy is necessary to determine the trend of consultations and admissions. Deployment regions were aware that the new service they implemented may imply implementation or continuous costs for new services. Moreover, the patients in some regions make additional use of the new services as they are valued and perceived positively, which generates extra costs in the first instance. Additionally, CareWell and this analysis have helped to identify where potential for future improvement exists, and under which conditions it can be utilised.

More in depth data and the analysis on each deployment region can be found in deliverable D8.4, chapter 3.

7.3 Referenced deliverables and milestones

Deliverables listed below can be found on CareWell project website.

Deliverable no.	WP no.	Deliverable name	Lead Beneficiary
D8.1	8	First report on dissemination and exploitation activities	empirica
D8.2A	8	Interim report on exploitation activities	empirica
D8.2B	8	Interim report on dissemination activities	empirica
D8.3	8	Final report on dissemination activities	empirica
D8.4	8	Final report on exploitation and deployment plans	empirica
D8.5	8	CareWell final conference	Kronikgune
D8.6	8	Guidelines for deployment	IFIC
D8.7	8	Integrated Care Glossary	IFIC

7.4 Lessons learned report

Things that went well

- The ASSIST cost-benefit analysis allowed analysis of the impacts of certain indicators on the service effectiveness (what if).
- The cost-benefit analysis helped systemise which positive and negative impacts result from the service implementation (especially by stakeholder).
- Best case and worse case scenarios illustrated the range of the most likely results of service implementation.
- Viability assessment is a process that triggers the imagination of participants and evolves during the project. The flexibility of the tool used allowed including aspects that have arisen only at a later stage.
- High commitment to scaling up services after project end to substantial numbers of new care recipients.
- All project partners were eager to disseminate information about their work and the CareWell project and achieved extraordinary media coverage.

Things that could have gone better

- A few dedicated site visits targeted at viability assessment with all stakeholders being available might have been more effective than frequent telephone conferences.

Things that surprised us

- Seed funding is a major contributor to overall service sustainability.
- More primary care contacts could substitute secondary care use, especially shorter hospitalisations.
- The biggest cost item is staff time during the operational phase of the service rather than service planning and implementation.
- Care recipients' overall service perception was generally positive.

Lessons learned

- External funding is a necessary facilitator to kick off services, and may allow becoming sustainable quicker.
- Closer monitoring of care recipients can lead to improved health outcomes and improve their experience of the services, yet does not necessarily lead to cost containment.
- Creating opportunities to involve key stakeholders at all stages of the project will not only facilitate feedback on what is working well and what is not working so



well, but will also make them feel valued and motivated to continue to make integrated care a reality, and optimise benefits for those delivering or receiving the new care model and services.

7.5 Recommendations

- **Recommendation 1:** Continue scaling up, but watch the critical factors identified during deployment planning.
- **Recommendation 2:** Optimise the time used by professionals, making the use of applications as time-effective as possible, because time is the most important cost factor.
- **Recommendation 3:** Provide a range of different mechanisms for key stakeholders to become involved and give their feedback as a continuum, as this will facilitate ongoing problem solving and learning.

8. Address of the project public website and relevant contact details






8.1 Project website & logo


Project website: <http://www.carewell-project.eu/home/>

Project logo:







8.2 Pilot sites





Beneficiary name	Contact person	Country	Logo
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8.3 Other partners

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8.4 Advisory Boards *

Non Beneficiary name	Contact person	Country	Logo
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Montpellier University	Prof. Jean Bousquet	FR	
Hospital Clinic Barcelona	Albert Alonso, MD	ES	
European Patients' Forum	Walter Atzori	LU	

Note: User Advisory Board members (*) are not CareWell partners (not entitled to receive any funding).