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# Strategic Intelligence Monitor on Personal Health Systems Phase 3 (SIMPHS3)

*Integrated care programme for  
older in- and out-patients,  
University Hospital of Getafe  
(Spain) Case Study Report*

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**Abstract**

For more than 20 years the Geriatrics Service of the University Hospital of Getafe (Hospital Universitario de Getafe – HUG) has been offering integrated care programmes for older in- and out-patients. These services provide continuous, progressive and coordinated attention to patients at high risk of functional decline, institutionalisation, and hospitalisation, at home or in residential care settings. The objective is to offer the most appropriate care according to the changing needs of the patients. The programme is twofold: for people admitted to the hospital, the care teams responsible for the different phases of the treatment are coordinated through periodic meetings (both physical and remote, the latter to coordinate care with other hospitals) and coordinate with the team in primary care before discharge; for patients who are at home or in residential care facilities, the programme includes follow-up of the patient directly, or in close collaboration with primary care and social care agents when needed.

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## Preface

The Strategic Intelligence Monitor on Personal Health Systems (SIMPHS) research started in 2009 with the analysis of the market for Remote Patient Monitoring and Treatment (RMT) within Personal Health Systems (PHS). This approach was complemented in a second phase (SIMPHS2) with the analysis of the demand side, focusing on needs, demands and experiences with PHS by healthcare producing units (e.g. hospitals, primary care centres), healthcare professionals, healthcare authorities and patients amongst others.

Building on the lessons learnt from SIMPHS2 and on the European Innovation Partnership on Active and Healthy Ageing initiative, SIMPHS3 aims to explore the factors that lead to successful deployment of integrated care and independent living, and define best operational practices and guidelines for further deployment in Europe. This case study report is one of a series of case studies developed to achieve these objectives.

The outcomes of SIMPHS2 are presented in a series of public reports which discuss the role of governance, innovation and impact assessment in enabling integrated care deployment. In addition, through the qualitative analysis of twenty seven Telehealth, Telecare and Integrated Care projects implemented across twenty regions in eight European countries investigated in SIMPHS2, eight facilitators have been identified, based on Suter's ten key principles for successful health systems integration.

The eight main facilitators identified among these as necessary for successful deployment and adoption of telehealth, telecare and integrated care in European regions are:

- Reorganisation of services,
- Patient focus,
- Governance mechanisms,
- Interoperable information systems
- Policy commitment,
- Engaged professionals,
- National investments and funding programmes, and
- Incentives and financing.

These eight facilitators have guided the analysis of the cases studied in SIMPHS3 and a graph showing the relative importance of each facilitator is presented in each case study.

In addition to the above facilitators analysed in each case report, a specific section is dedicated to the analysis of care integration. It should be noted that the definition of vertical and horizontal integration used in this research is taken from the scientific literature in the field of integrated care<sup>1</sup> and differs from the one mentioned in the European Innovation Partnership on Active and Healthy Ageing Strategic Implementation Plan.<sup>2</sup> We define horizontal integration as the situation where similar organisations/units at the same level join together (e.g. two hospitals) and vertical integration as the combination of different organisations/units at different level (e.g. hospital, primary care and social care).

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<sup>1</sup> Kodner, D. (2009). All together now A conceptual Exploration of Integrated Care.

<sup>2</sup> [http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/steering-group/operational\\_plan.pdf](http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/steering-group/operational_plan.pdf)  
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## List of abbreviations

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<b>CCU</b>	Community Care Unit
<b>CPI</b>	Compra Pública Innovadora - Public Procurement for Innovation Program
<b>CS</b>	Consejería de Sanidad (Regional Ministry of Health)
<b>ER</b>	Emergency Room
<b>HF</b>	Heart Failure
<b>HUG</b>	Hospital Universitario de Getafe – University Hospital of Getafe
<b>MSSSI</b>	Ministerio de Sanidad, Servicios Sociales e Igualdad - Ministry of Health, Social Services and Equality
<b>SERMAS</b>	Servicio Madrileño de Salud - Regional Ministry of Health
<b>SNS</b>	Sistema Nacional de Salud - Spanish National Healthcare System
<b>VPN</b>	Virtual Private Network

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## Case outlook

For more than 20 years, the Geriatrics Service of the University Hospital of Getafe (Hospital Universitario de Getafe – HUG) has been offering an integrated care programme for older in- and out-patients. This programme provides continuous, progressive and coordinated attention to patients at high risk of functional decline, institutionalisation, and hospitalisation, at home or in residential care settings. The objective is to offer the most appropriate care according to the changing needs of the patients. The programme is twofold: for people admitted to the hospital, the care teams responsible for the different phases of the treatment are coordinated through periodic meetings (both physical and remote, the latter to coordinate care with other hospitals) and coordinate with the team in primary care before discharge; for patients who are at home or in residential care facilities, the programme includes follow-up of the patient directly, or in close collaboration with primary care and social care agents when needed.

This integrated care programme has been adjusted and modified over time in order to take account of new standards of care and new clinical research findings. The HUG Geriatrics Service currently has a Community Care Unit (hereafter CCU) involving two geriatricians who visit patients at home on a regular basis. The geriatricians carry a '*medical toolkit*' comprising a laptop, a small printer, a 3G USB drive that allows them to remotely connect to the hospital's Virtual Private Network, and some measuring devices, such as a blood pressure cuff or an oxygen saturation meter. The geriatricians can access the patient's medical records from the hospital's Health Information System at the beginning of the visit, and can upload the information gathered during the visit (measurements, questionnaires, etc.) to the hospital's information system. Moreover, professionals in primary care can also access this information. As a result, general practitioners can get a more complete overview of the health status of the patient right after the visit. Finally, the CCU geriatricians make periodic appointments with primary care physicians at ambulatory centres to get a better understanding of a patient's case.

Integration with other stakeholders, such as nursing homes or social services, is carried out in an informal way. There is no actual integration of information systems, and both nursing homes and social services have their own databases where they keep information about their users. Moreover, each nursing home or nursing home company can have their own proprietary database, and there is no obligation for these databases to comply with healthcare data exchange standards such as HL7 or CDA. Moreover, in many cases the communication between the geriatrician and the general practitioner is carried out via telephone.

The model of care adopted by the Geriatrics Service has had a positive impact both in health and economic terms. Thanks to the coordinated work of all units in the Geriatrics Service, the average length of stay in the Acute Care Unit (part of the Geriatrics Service) is more than 2 days shorter than in other departments of the hospital which attend patients with a similar case-mix (6.8 vs 9.1 days according to internal data from November 2014). This reduced length of stay leads to an estimated cost reduction of €1,000/patient. Furthermore, HUG estimates that 400 inappropriate admissions have been avoided per year. Overall, the coordinated care programme has led to savings of approximately €1.5 million.

In 2011, the Geriatrics Service conducted a two year randomized, non-blinded, trial aiming to investigate the clinical benefits and feasibility of integrating an ICT-based tele-monitoring system to remotely assess patients suffering from Heart Failure. Patients were provided with a smartphone with a dedicated application and a set of measuring devices, such as a blood pressure cuff and a weight scale, and were requested to regularly report their measurements and other information such as their functional status or symptoms. A total of 90 patients participated in the study, 72.2% were women and the median age was 86. In total, 50 patients were included in the intervention group, and 40 in the control group. The intervention group had a better clinical outcome than the control group. Clinical outcome was defined as a composite indicator composed of the number of visits to the Emergency Room (ER) and the number of readmissions. Moreover, in the intervention group, 80% of readmissions were shorter than or equal to 7 days long, while in the control group the length of stay reached 13 days. Finally, in the intervention group the gait speed variability and oxygen saturation were statistically significant as clinical markers, while other variables such as blood pressure or weight were not meaningful. The results of this study will be published in 2015.

To sum up, the practices adopted by the Geriatrics Service in the University Hospital of Getafe, based on continuous and integrated care, have been demonstrated to produce the best results in both economic and healthcare terms. This model has been implemented thanks to the commitment of professionals and the collaboration between different tiers of care and among different departments in the Hospital. However, there is still a lot to be done. Finding funds for the long-term implementation of innovative initiatives is still a barrier, and closer collaboration between all the stakeholders who participate in the health care of older patients is needed.

The Geriatrics Service of the University Hospital of Getafe was designated as a Reference Site by the European Innovation Partnership on Active and Healthy Ageing, and received 3 stars.

# 1 Background

## 1.1 Spain

The Kingdom of Spain is a sovereign state in the Iberian Peninsula in south-western Europe. It is bordered by the Bay of Biscay, France and Andorra to the north, the Mediterranean Sea to the east, and to the south, Portugal to the west and the Atlantic Ocean to the south- and northwest. Spain has some territories outside the Iberian Peninsula: Balearic Islands in the Mediterranean Sea, Canary Islands in the Atlantic Ocean and Ceuta and Melilla in the African shore of the Strait of Gibraltar.

Spain has been a parliamentary monarchy since 1978. As a parliamentary monarchy, after every election the king proposes the Prime Minister to the Lower House of Parliament for approval. Then the Prime Minister designates the Government cabinet. Spain became a member of the European Union in 1986.

The Kingdom of Spain comprises 17 highly decentralised regions (named Comunidades Autónomas, Autonomous Communities – AC) which have exclusive powers in fields such as finance or healthcare provision. The ACs are political-administrative entities that were created with the objective of ensuring the autonomy of the different historical nationalities within Spain.

According to data from the Spanish National Institute of Statistics, in July 2014 Spain had an overall population of 46,464,053 inhabitants<sup>3</sup>. The Spanish population has been decreasing significantly since the beginning of the economic crisis in 2008, especially in the case of foreign nationals.

Life expectancy in Spain is one of the highest in the European region, especially in the case of women. According to the WHO's World Health Statistics 2014, in 2012 female life expectancy in Spain was 85.1, the 2nd highest in the world. According to data from the Spanish National Institute of Statistics, by the end of 2011 up to 17.3% of the overall population was over 65 years old. According to data from the World Bank<sup>4</sup>, the birth rate in Spain in 2012 was of 10 new-borns for each 1,000 inhabitants, one of the lowest in the world. Hence, the population in Spain is rapidly growing older: it is estimated that, by 2050, 36.5% of the overall population will be over 65 years old.

Spain was particularly hard hit by the global economic crisis that started in 2008. With an unemployment rate of around 25% of the labour force, Spain's GDP dropped by approximately 6% from 2008 to 2015. According to data provided by the National Ministry of Health, Social Services and Equality, global health expenditure in Spain dropped by approximately 4%, from €66,857,466 in 2008 to €64,150,289 in 2012.<sup>5</sup> From 2007 to 2011, the average annual growth rate of the total healthcare expenditure was 2.5% (3.0% in public expenditure and 1.4% in private expenditure) (Ministerio de Sanidad, Servicios Sociales e Igualdad, 2014). Cuts in healthcare funding were especially dramatic in 2012, when the budget of the Ministry of Health, Social Services and Equality was reduced by 5.7%. In July 2012, pharmaceutical co-payment was introduced: medication for treating minor conditions was excluded from the free healthcare service provision, while co-payments depending on revenues were established for medicines for more serious conditions. Moreover, illegal immigrants and Spanish citizens over 26 not receiving

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<sup>3</sup> [http://www.ine.es/en/inebaseDYN/cp30321/cp\\_inicio\\_en.html](http://www.ine.es/en/inebaseDYN/cp30321/cp_inicio_en.html) (in Spanish)

<sup>4</sup> <http://data.worldbank.org/indicator/SP.DYN.CBRT.IN>

<sup>5</sup> <https://www.msssi.gob.es/estadEstudios/estadisticas/sisInfSanSNS/pdf/egspGastoReal.pdf>

unemployment benefits were excluded from the system. Table 1 shows the evolution of the health expenditure in Spain from 2007 to 2012, including long-term care (Ministerio de Sanidad, Servicios Sociales e Igualdad, 2014):

**Table 1: Health Expenditure in Spain from 2007-2012**

Million Euros	2007	2008	2009	2010	2011	2012
<b>Public Health Expenditure</b>	64.232	70.848	75.355	75.007	72.510	68.607
<b>Private Health Expenditure</b>	25.169	26.244	25.120	25.875	26.312	27.064
<b>Total Expenditure</b>	89.401	97.092	100.475	100.882	98.823	95.670

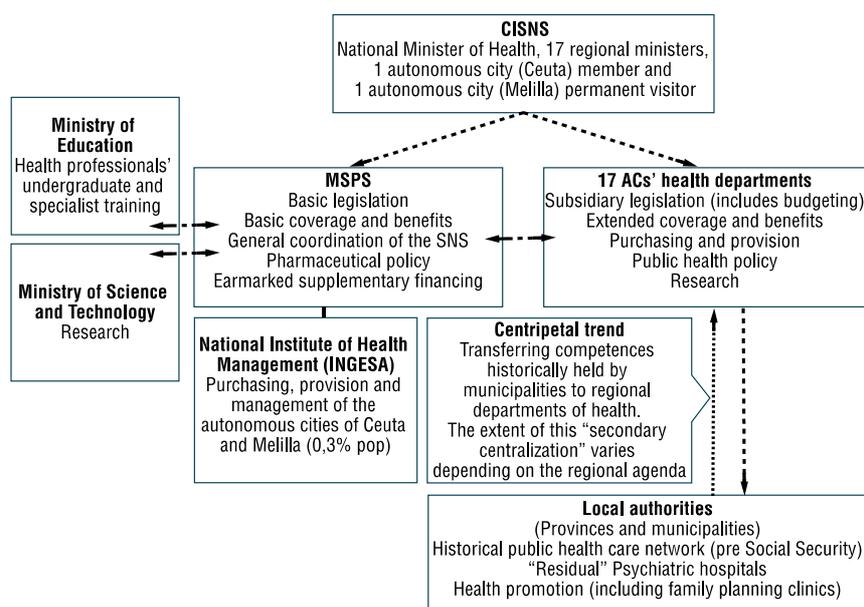
## 1.2 The Spanish Health System

The Spanish healthcare system is a National Health System that provides Spanish citizens with universal coverage, as defined in the Spanish Constitution of 1978. The Spanish National Healthcare System (SNS) is a clear example of a Beveridge model: the Government acts as the main body responsible for providing citizens with healthcare and the system is funded through taxes. Budget for each fiscal year is allocated by the National Government in the General State Budget. Healthcare provision is free of charge at the point of delivery, with the exception of some pharmaceuticals prescribed for citizens under 65, who are charged with 40% co-payment, with some exceptions.

The National Ministry of Health, Social Services and Equality (MSSSI) is the Government body responsible for the planning and execution of the national health policy, for planning and providing healthcare and for ensuring that citizens' rights to health services are respected. Therefore, the MSSSI is responsible for actions such as the legislation on pharmaceuticals or the definition of the portfolio of healthcare services that should be provided by the Regional Health Systems. Nevertheless, management of healthcare has been delegated to the regional governments. Devolution of health competences to the regions was completed in 2002. Since then, each of the 17 Regions in Spain have complete jurisdiction over the healthcare delivery and organisation within their boundaries.

Typically, the organisation of the regional healthcare systems comprises a Regional Health Ministry (Consejería de Sanidad, CS) and a regional health service that acts as the main healthcare provider. CSs are responsible for the territorial organisation of health services, the general definition of health policies (within the framework provided by MSSSI) (García-Armesto, Abadía-Taira, Durán, Hernández-Quevedo, & Bernal-Delgado, 2010). Figure 1 shows an overview of the structure of the Spanish National Health System.

**Figure 1: Spanish National Health System characterization**



Source: García-Armesto, Abadía-Taira, Durán, Hernández-Quevedo, & Bernal-Delgado, 2010

Health expenditure in Spain amounted to 9.4% of GDP (\$US 2,998 per capita) in 2011, slightly above the OECD average (9.3%). Public funds supported 73% of the total budget (OECD Health Statistics 2014). These public resources are levied mainly by taxation (94.07% of total), while payroll and employers' contributions to the work injuries and professional diseases mutuality schemes amount to 2.53% of public health funds; the mutual funds catering for civil servants cover the remaining 3.4%.

The Spanish National Government provides each Autonomous Community with general resources<sup>6</sup> according to their population, area and special conditions such as insularity. ACs can freely allocate those funds among their Ministries. This freedom gives rise to heterogeneity in health expenditure per capita and access to different baskets of service, as each AC can give more or less importance and support to health issues. For instance, in 2009 the public health service of Extremadura (one of the poorest and least developed ACs) spent €1,560.82 per capita, while its counterpart from La Rioja (much wealthier) spent €1,094.98. (García-Armesto, 2010)

Private Voluntary Insurance (PVI) plays only a minor role in the Spanish healthcare system, and it is mostly used for specific specialties such as Dental Surgery, to skip waiting lists or for complementary care. (5.9% of total healthcare expenditure). Citizens can freely purchase health care services from private health insurers (e.g. Sanitas, Adeslas, AXA, etc.) that contract private health providers (e.g. Quirón, Ruber, etc.) or independent specialists. Moreover, some of them own and manage their own hospitals and clinics, and also work as health providers. 13% of the total population in Spain is covered by private health plans. (García-Armesto, 2010).

<sup>6</sup> Basque Country and Navarra have special conditions due to historical issues. They self-finance and support their own regional services (health, regional police bodies, etc). Contrarily, they must reimburse an annual invoice for the services provided by the Central Government (National police, Justice, etc).

In recent years Spanish health-policy makers have been increasingly using a mixed healthcare system model combining public funds and private operations. Some services such as hospital management, imaging diagnostic tests or surgery have been outsourced to avoid waiting lists in public facilities and promote control over the available resources and efficiency. However, corruption scandals about the allocation of contracts have raised scepticism among the public and led policy makers to rethink the whole process.

Spanish legislation has established a set of criteria for classifying hospitals depending on the services portfolio and the specialties offered. The Order 146/1985, updated in May 23, 2014, provides the following definitions of healthcare settings for the provision of in-patient care:

- Level 1: Acute General Hospital comprising the adequate units and service in order to provide citizens with healthcare at a district level. It might comprise higher-level services and be complemented with services in the same scope provided by other centres.

In order to qualify as a Level 1 Hospital, a hospital has to provide the following services: General Medicine, General Surgery, Traumatology, Gynaecologic Obstetrics and Paediatrics. Optional services include an outpatient Nephrology Unit with consultations and dialysis and specialities such as Ophthalmology, Otorhinolaryngology, Urology, Cardiology and Psychiatry.

- Level 2: Acute General Hospital comprising the units and services required to provide citizens with top-level healthcare at a Health Area level. Level 2 hospitals may include regional-level services and be complemented with other highly specialised services located in other centres.

Level 2 Hospitals provide acute patients with care in the following specialties: Internal Medicine, General Surgery, Traumatology, Gynaecology, Paediatrics, Nephrology, Psychiatry, Ophthalmology, ORL, Urology, Cardiology and Dermatology. Optional services, depending on planning criteria, include specialities such as Paediatric Surgery, Cardiovascular Surgery, Neurosurgery, Thoracic Surgery, Plastic Surgery and Maxillofacial Surgery.

- Level 3: Level 3 hospitals are subject to similar conditions to those applying to level 2 hospitals, with some slight differences. For instance, one physician from each clinical and diagnostic service has to be available within a timeframe of 20 minutes, and other professionals have to be on standby. Besides, designated spaces for a Resuscitation Room, a Radiology room and one Surgery Room should be available.
- Medical-Surgical Clinic: Acute care hospital with units for treating citizens under medical or surgical processes. Optionally, they can offer obstetrical care or specialised medical or surgical care. Specialties can include Oncology, Obstetrics, Traumatology, Cardiology, Psychiatry, Nephrology, Paediatrics or Infectious Diseases.
- Minimum Care Hospitals for medium and long stays: hospitals that provide care for patients who need to be hospitalised for more than 30 days in 50% of cases. They usually provide care for pathologies for which no high-cost equipment is required.

In the context of this report, it is worth noting that general hospitals in Spain are not required to have a Geriatrics Service in order to be considered as Level 1 or 2 hospitals.

From a total 37 hospitals in Madrid, only a few have a Geriatrics Service, like the University Hospital of Getafe.

### **1.3 The Regional Health Service in Madrid**

The Comunidad de Madrid is a region in the centre of Spain. It is the third most populous (6,495,551 inhabitants) and the most densely populated (809.11 inhabitants/km<sup>2</sup>) region in Spain. Half of its inhabitants live in the largest city in Spain, Madrid (3,165,235 inhabitants, Padrón Municipal de Habitantes, 2011). Móstoles, Fuenlabrada or Leganés are also important population nuclei which are merged into the Madrid Metropolitan Area, the largest economic engine in Spain. The Region of Madrid has the second largest GDP per capita in Spain (€31,600), slightly below the Basque Country (€32,200) and well above the Spanish average (€23,000) (Eurostat, 2011). Despite being a wealthy and developed region, public expenditure in health is low (4.1% of GDP) compared to other Spanish ACs (5.8% of total GDP in average) (Lillo, 2014).

Getafe is a residential town in the south of Madrid's metropolitan area. Its population grew considerably in the 50s and 60s due to the establishment of many international companies such as Ericsson, Siemens, John Deere, etc. and the immigration of young workers looking for jobs from other regions in Spain. Since 1950, the population has grown over tenfold from 12,254 in 1950 to 170,115 in 2011<sup>7</sup>. This notable growth made it necessary to build a hospital that met the demand of Getafe's citizens (and those from other towns around). Finally, in 1991, the University Hospital of Getafe was founded.

The Consejería de Sanidad de la Comunidad de Madrid (Ministry of Health of the Region of Madrid) is the regional body responsible for the healthcare services in the Region of Madrid. The services are provided through the Servicio Madrileño de Salud (SERMAS, Health Service of the Region of Madrid), which integrates all the public healthcare organisations of the Region of Madrid. The SERMAS is under the authority of the Regional Vice-Ministry of Health. It was created in 2001, along with the Health Institute of Madrid, as part of the devolution of health competences from the National state to the different regions in Spain. Later, in 2005, the Health Service of Madrid was integrated with the Health Institute of Madrid, and its name changed to SERMAS, in order to avoid duplication and foster rationalisation, efficacy, simplification and efficiency in healthcare provision.

Order 23/2008 established the organisational structure of the SERMAS which comprises a set of General Directorates covering Primary Care, Hospitals, Patient Service, Economic Management and Procurement of Healthcare and Pharmaceutical Products, Human Resources, Health Information Systems and Management and Control of the Healthcare Centres under Indirect Management. In 2014, Order 23/2014 changed the organisational structure of the SERMAS to improve its efficiency. For example, the General Directorate of Hospitals was renamed the General Directorate of Specialised Care. In addition, the General Directorate of Management and Control of the Healthcare Centres under Indirect Management was discontinued, and its competences transferred to the General Directorate of Specialised Care and the General Directorate of Economic Management and Procurement of Healthcare and Pharmaceutical Products.

Moreover, Law 6/2009 re-organised the overall territory of the Region of Madrid, merging the 11 Healthcare Areas in the Region into a Single Healthcare Area. One of the main objectives of the integration of all health areas into a single health area was to ensure that

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<sup>7</sup> (Instituto Nacional de Estadística (INE),2011)

patients could freely choose a physician across the whole region. Order 52/2010 defined the basic structures of the Single Healthcare Area including the Basic Healthcare Area, which is the territorial framework where health centres carry out their activities.

#### **1.4 The Geriatrics Service at the University Hospital of Getafe**

The University Hospital of Getafe (HUG) is one of the 23 general hospitals under SERMAS. The HUG started its operations in 1991, providing service to over 200,000 inhabitants and covering 13 municipalities including urban centres such as Getafe (over 170,000 inhabitants) and Pinto (over 47,000 inhabitants in 2014). The HUG is a Level 2 hospital with a staff of around 2,300 people. The HUG offers up to 39 specialties, including key specialties such as General Surgery, Cardiology, Paediatrics, Genetics or an Intensive Care Unit (ICU). Despite its youth, the HUG is recognised as a reference hospital in specialties such as the Burns Unit, the Transplants Unit or the Tissue Bank. Moreover, as a University Hospital, the HUG also has a teaching facility, and is accredited to teach Medicine to Degree level in collaboration with the Universidad Europea de Madrid.

Amongst all the services provided, the HUG has a Geriatrics Service that treats more than 5,000 older patients/year (in 2013, 2,874 patients were assessed at outpatient visits, 276 at the Day Hospital, 214 by Liaison Team and 1,714 were hospitalised). It is worth noting that not all hospitals in the Region of Madrid have a Geriatrics Service: of the 37 hospitals in Madrid, only 7 have a Geriatrics Service. Of these 7, only 3 (including the University Hospital of Getafe) have a Community Care Unit.

The Geriatrics Service of the University Hospital of Getafe has 10 physicians plus support staff. The 10 geriatricians are divided into different units as follows: (1) the Community Care Unit has 2 professionals; (2) the Outpatient Office and Day Hospital, 1 professional; (3) the Falls and Fractures Unit, 1 professional; (4) the Acute Care Unit, 4 professionals, (5) the Liaison Team, 1 professional and, finally, (6) a Head of the Geriatrics Service. Support staff include 1 secretary, 1 assistant nurse and 2 dedicated nurses (1 in the Acute Care Unit and 1 in the Geriatrics Service), 1 occupational therapist and 1 social worker, shared with other services in the Hospital.

The HUG Geriatrics Service has implemented a set of good practices that include the Falls and Fracture Unit and the integrated care programme for older in- and out-patients. It has been selected as a Reference Site within the European Innovation Partnership on Active and Healthy Ageing, where it has been awarded 3 stars (the highest qualification awarded).

The Falls and Fracture Unit was launched in 2009, and offers integrated care for older people with, or at risk of, falls and fractures. The approach aims to assess the risk of falls and fractures in all subjects at risk, intervene whenever needed and follow-up patients in rehabilitation. This unit has established a research environment that allows the development and validation of assessment tools and intervention models. According to the data provided by the HUG, this unit serves a total 620 patients, and has led to total saving of approximately €120,000 by reducing hospitalization periods.

The integrated care programme for older in- and out-patients offers continuous, progressive and coordinated attention to patients at high risk of functional decline, institutionalisation and hospitalisation, at home or in residential care settings. This programme will be presented and analysed in this report.

## **2 Integrated care analysis**

### **2.1 Dimensions of integration**

The Geriatrics Service in the HUG has adopted an approach that puts the focus on continuous and coordinated care. In order to turn this vision into reality, the Geriatrics Service did not need any expensive equipment or any complicated procedures; instead, the programme for continuous and coordinated care focuses on assessing the functional level of the patient rather than his or her comorbidity level. The Community Care Unit (CCU) is the body within the Geriatrics Service responsible for implementing this programme which provides comprehensive and continuous care, based on careful coordination amongst the different stakeholders involved (geriatric facilities, other specialists, primary care and social resources).

The work of the Community Care Unit (CCU) is a clear case of vertical integration, which involves the combination of different organisations/units at different levels (e.g. hospital, community health centre, home care agency and nursing home). Patients are referred to the Geriatrics Service from other services in the hospital (i.e. the ER) or from the nursing homes. Once patients are hospitalised, they are assessed by the professionals in the Geriatrics Service, who decide where patients should be referred after being discharged and what type of assessment they should get. The discharge plan is communicated to the patient's GP in primary care. Then, patients who are included in the home visits programme can be referred by the geriatrician to other services in the hospital. These decisions are taken in multidisciplinary meetings, held weekly.

The degree of integration can be considered as medium. There is no integration at organisational level. Communication between the CCU and the rest of services and stakeholders is informal and based on personal knowledge, and it is not carried out through any hospital Information System. Currently, different hospital services can exchange information about patients using the hospital's Information System. All services can use a system called x-GPC (or Gestor extensible de Peticiones Clínicas, a system which allows the hospital to manage clinical requests) in order to file a consultation request (Parte de Interconsulta) which becomes available to professionals in other services. A consultation request refers to the communication between two health professionals, where a professional asks another professional about a specific pathology. The consultation request is a fundamental tool in ensuring the link between primary and secondary care. Nevertheless, for the case considered in this report, the xGPC is not usually used as a bidirectional communication channel between the Geriatrics Service and other hospital services and units to coordinate the continuous care of patients outside the hospital. 90% of CCU patients come from the Geriatrics Service. The referral of patients from other services is performed through a consultation request.

In general, the communication between the CCU and the other stakeholders collaborating in out-patient care (primary care, social services, nursing homes, other hospital services) is carried out using traditional channels such as the telephone, e-mail or fax, depending on each agent's capabilities. Fax is mostly used for communicating with nursing homes.

The use of a laptop, a small printer and a secure connection to the hospital has led to a certain level of integration in terms of information sharing. Before the use of the toolkit, physicians who performed the home visits had to ask for the patient's record 24 – 72 hours in advance. Moreover, they had to carry physical copies of the patient's record to the patient's home or nursing home. During the visit, physicians used to fill two copies of a visit

report, one for the patient and one for the Geriatrics Service. If the patient wanted to share information about the visit with a health professional in primary or secondary care, they had to take the physical copy of the report with them. Nowadays, the medical toolkit allows travelling physicians to connect to the hospital's intranet and to view, edit and create patient records. Therefore, all data gathered during the visit can be uploaded on site to the hospital's intranet and are available to other services in the hospital. Moreover, approximately 3 years ago, the hospital's IT Department provided primary care with access to the hospital's intranet. Nevertheless, no integration has been carried out with the information systems of other stakeholders, such as nursing homes. Nursing homes have their own proprietary information systems where they store data about their clients. These information systems are not connected in any way with the hospital's Information System, hence preventing full integration of care.

## **2.2 Impact**

The University Hospital of Getafe is the reference public hospital for an area in the Region of Madrid with approximately 200,000 inhabitants. 1,500 patients are treated per year between the ER, the Community Care Unit, primary care and nursing homes. These 1,500 patients include (1) patients referred by other services via consultation requests and (2) patients treated at their homes or nursing homes by the Community Care Unit. These figures do not include patients treated by the Acute Care Unit or at hospital consultations.

From a clinical point of view, it worth mentioning that the average length of stay in the Acute Care Unit is significantly lower than the average stay in other departments which deal with patients with a similar case mix (6.8 vs 9.1 days). Moreover, mortality and re-admissions do not increase - on the contrary, there are improvements in patients' functional status during their stay in the Acute Care Unit. Moreover, other indicators such as time to surgery, the need for transfusion and surgical complications in hip fractures have also improved in the Orthogeriatrics Unit. The Geriatrics Service has also treated a higher number of patients at the Day Hospital and the number of sessions per patient has increased, which has resulted in an increase in the percentage of patients showing functional improvement after their stay at the hospital. Finally, the number of unnecessary hospitalisations has been reduced by around 400 patients/year<sup>8</sup>. Considering that the average cost of hospitalisation per day is €500, a reduction of 400 inappropriate hospitalisations can save an estimated €1.5 million.

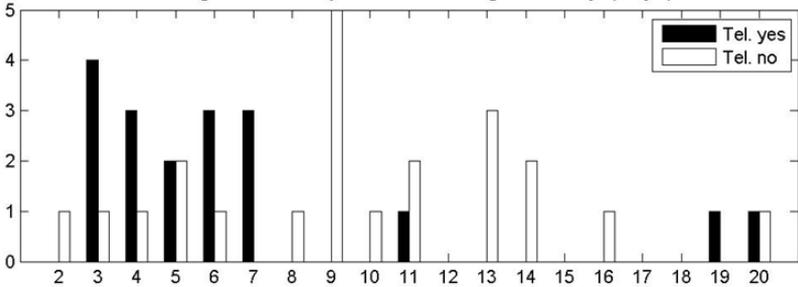
From 2011 to 2013, the CCU conducted a study to validate the feasibility and clinical impact of using an ICT-based monitoring system to remotely assess the health condition of older patients suffering from Heart Failure (HF). In coordination with other national stakeholders, the CCU carried out a two-year randomized, non-blind trial, with a follow-up at 6 months after discharge from a hospitalisation due to a HF decompensation. After discharge, patients were provided with a remote monitoring system able to acquire data on vital signs, symptoms of HF exacerbation and functional status of the patient. The control group received the routine follow-up provided by the CCU, including home visits. A total of 90 patients participated in the study, 72.2% of whom were women, and the median age of the sample group was 86 years old. 50 out of 90 patients were included in the intervention group, out of which 47 participated in the study, and 40 were in the control group. HUG analysed data from the study in 2014 and the outcomes are currently in press.

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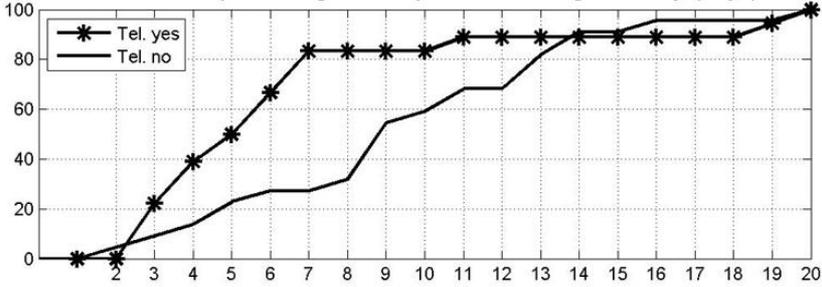
<sup>8</sup> Data provided by the HUG

The intervention group had a better clinical outcome than the control group, and 80% of patient hospitalisations in the intervention group were shorter than or equal to 7 days. On the other hand, in the control group, hospitalisations were shorter than or equal to 13 days. Overall, the mean difference was of 3.5 days. Figure 2 and Figure 3 present a histogram of hospitalisation length and the cumulative percentage of hospitalisation length of stay, respectively. The data included in these figures have been provided by the HUG and will be published in the near future.

**Figure 2: Histogram of hospitalisation length (in days)**



**Figure 3: Cumulative percentage of hospitalisation length of stay (in days)**



Besides the clinical benefits of shorter hospitalisations that have an impact on patient’s quality of life, this difference amounts to an estimated cost saving of approximately €1,750 per patient. Moreover, other clinical indicators such as gait speed variability and oxygen variability improved and were statistically significant in the intervention group.

In conclusion, the study demonstrated the feasibility and effectiveness of using telemonitoring systems to remotely follow-up older patients with heart failure. The results of this study open new possibilities for the both for the CCU and for other hospitals which will roll out similar initiatives.

**2.3 Drivers and barriers**

**Computerisation** has contributed to the success of the integrated care programme for older in- and out-patients. The use of Health Information Systems in routine practice has facilitated the work of the physicians who visit patients at their homes or nursing homes. Before computerisation, physicians had to ask for the patients’ records 24 – 72 hours in advance, and had to carry these paper documents with them. During the visit, the physician wrote two copies of the report of the visit, one for the patient and one for the hospital. Therefore, in order to share the information about the visit with a professional in primary care or specialised care, the patient had to carry a physical copy of the report when visiting the professional, or the professional had to ask for the patient’s history before an appointment. In order to overcome this overload of work and documents, the Geriatrics Service asked the IT Department of the hospital to take advantage of the available Health

Information Systems, even from a remote location. The IT Department set up a secure connection to the hospital's virtual private network (VPN), thereby allowing physicians out of the hospital to access patient records and upload new information to the Hospital's Health Information System. After this, professionals from primary care or other services in the hospital could access the information gathered during the visit immediately after it had taken place.

The creation and the ongoing work of the Community Care Unit have been possible thanks to the **commitment of the professionals** in the Geriatrics Service. All professionals in the Geriatrics Service share a vision that was inherited from the former service to older patients provided by the Red Cross Hospital. The Geriatrics Service of the University Hospital of Getafe has adopted a model of geriatric care that puts integration at the centre. The CCU was started by a doctor who had to use his own car to visit patients, and thereafter the Unit progressed due to the commitment of all the professionals involved. This, and the collaboration of other hospital departments, such as the IT Department, has made it possible to continue the work carried out within the CCU.

**Public funds** have also been key in ensuring the implementation of the actions envisioned by the CCU. Most of the material needed to implement the integrated care programme comes from National projects funds, such as the HRF funds used to implement the remote HF monitoring programme. Moreover, many of the features offered by the Geriatrics Service have received national or European funds, including materials such as the Laboratory for Functional Assessment, the GAITrite system, the position meter or the two ultrasound machines.

Regarding barriers, **organisational processes** within the hospital and in relation to the Regional authorities hinder the implementation of innovative approaches. As an example, despite the collaboration of the hospital's IT Department, it took almost a year to get the USB 3G Drive that allows physicians to connect to the hospital's virtual private network. This gives an idea of the bureaucratic hurdles the CCU had to overcome in order to implement their vision. Moreover, some of the managerial and clinical personnel in the hospital considered that primary care should be responsible for providing patients with remote care at their homes or nursing homes.

**The lack of integration with social services and nursing homes** was also a barrier hindering fully integrated care. As stated earlier, nursing homes have their own databases where they store information about their patients, and these databases are totally independent from the databases in the hospital's Health Information System. Moreover, only professionals from the hospitals and professionals from primary care are provided with access to the data uploaded by the visiting physician. What's more, there is some resistance from social services and nursing homes to fully integrate with the rest of healthcare agents. Their perception of the new model and commitment to it should be improved to ensure the highest degree of integration.

Another problem comes from the fact that **many professionals** in primary care or other services in the hospital, such as the ER, **lack proper training in geriatrics**, which leads to the use of suboptimal criteria for referral, preventing some of the patients who could benefit the most from being attended by the most adequate service. In this sense, many patients are referred to the Geriatrics Service when their functional level is so low that it is beyond recovery, and some patients whose functional level could be improved by the treatment provided by the Geriatrics Service are never referred to the Service. This leads to

an increase in the number of readmissions and functional decline of otherwise patients who could have recovered.

The **lack of a communication channel between patients and the CCU** also hinders the continuum of care and the comprehensive approach. The secretary of the Geriatrics Service is the only current point of contact for patients who can reach her by phone. Thus, users only have access to CCU support during working hours and professionals are not always available. Moreover, phone calls are informal and there are no protocols for communication or any record of the outcomes that enable later analysis and sharing of the information. The establishment of communication means and communication standards might allow the CCU unit to prevent sudden worsening and consequent visits to ER, hospitalisation and further avoidable interventions. The implementation of any new healthcare service usually requires investing more resources. In the case of the CCU **the Geriatric Service cannot count on any additional revenues**. Despite the initial support for the purchase of equipment, neither the HUG nor the SERMAS have increased the budgetary line to run the CCU. Moreover the Comunidad de Madrid Government seems indifferent to the launch and financing of research or innovation programmes with regional funds. Hence the Geriatric Service is running a new additional service, using the same resources as before introducing this service. In order to deal with this type of situation, the Geriatrics Service in HUG applies for funding from national and European research and innovation programmes. In addition, professionals do not receive any incentive for their contribution to the CCU and the related extra workload. This may prevent other doctors from joining or replicating the CCU, and also the scaling-up of the integrated care approach.

#### **2.4 Health professional and patients**

The application of the new comprehensive and extended care model implied the direct creation of new jobs. More specifically, 2 new geriatricians were enrolled in the Geriatrics Service of HUG, and 1 Nurse, 2 Clinical Pharmacologist and 1 Occupational Therapist were also hired. Moreover, in 2014 3 engineers joined the team at the Hospital and an eHealth Unit was created. The eHealth unit participated in the analysis of the HF tele monitoring study outcomes and is currently working to improve the Geriatric Service Information System and the patient data management system.

There are no incentives for participating in programmes such as the continuous and coordinated care programme: all professionals have the same basic salary depending on their seniority, in addition they receive a supplementary productivity bonus. However, 75% of the productivity bonus is fixed so productivity does not impact so much on the salary level.

All professionals from the Geriatrics Service and from primary care need to be aware of the work carried out by the CCU. During their medical residency, all General Practitioners have to complete a stay in the Geriatrics Service, where they can learn about all programmes and procedures adopted by the service. Moreover, all geriatricians have to rotate through the Community Care Unit and participate in the home visits. Therefore, after they complete their training both geriatricians and general practitioners are totally aware of the continuous and coordinated care program. On the other hand, other professionals from other services might not receive any training in geriatrics or get informed about the work carried out by the CCU. The lack of training in geriatrics can have drawbacks, such as inappropriate referrals, non-referrals for patients who could benefit greatly from the

integrated care programme, or an increase in hospitalisations. These may lead to overuse or underuse of available resources, facilities and workforce.

The continuous and coordinated care programme is included as part of the services offered by the public health system in the Region of Madrid. The University Hospital of Getafe is the reference public hospital for a zone of the Region of Madrid with around 200,000 inhabitants. Most of these citizens use the public health service, especially older patients. Although regional legislation provides patients with the possibility to choose the hospital where they want to be attended, the University Hospital of Getafe attends more than 90% of the patients in its coverage area. Besides, due to the high price of building land in the city of Madrid, during the 1990s and 2000s several nursing homes were built in the outskirts of the city, in places like Getafe. This means that many users who were attended in hospitals in the centre of Madrid were institutionalised in nursing homes in Getafe.

There are four entry points for patients attended by the CCU:

- Nursing homes can send lists of patients who are candidates to join the programme.
- On request of the GP, who is the final disease manager in the Spanish healthcare system.
- Discharge from an Acute Care Unit or any other level of care of the Geriatrics Service. Geriatricians in the inpatient service identify unstable patients and refer them to the CCU for their after-discharge follow-up.
- Discharge from Emergency Room. Patients discharged from the ER who are not hospitalised but are considered unstable are also referred to the CCU.

Regarding the deployment of innovative approaches such as the Heart Failure telemonitoring system, the characteristics of patients attended by the Geriatrics Services – older, with functional impairments in many cases – poses a set of challenges in terms of compliance and continuous use. For instance, in the case of the pilot of HF, one of the inclusion criteria was the presence of an informal caregiver who should take responsibility for inserting the data in the system. Hence, older patients did not use the smartphone at all during the pilot, and all data were inserted by the informal caregiver. In order to deploy innovative systems on a larger scale, it is of paramount importance to guarantee the usability and accessibility of the system. It is also crucial to provide support to those patients who are unable to deal with new technologies and devices. This way, the care model could be scaled-up more efficiently.

## **2.5 Information and Communication Technologies**

When visiting a patient at home or at a residential care facility, the physician carries a kit comprising a laptop with an internet connection and a small printer. The physician connects to a Virtual Private Network from the user's location, using a local Wi-Fi connection or a 3G USB stick modem. Once connected, the physician can access the patient's records, generate a report in the HUG Health Information System and print it.

HUG has developed a proprietary medical information visualisation tool, called Clinical Documentation (CD). CD aggregates data from different Health Information Systems available in the hospital. These HIS include medical imaging in PACS format, lab imaging, bronchoscopy reports, endoscopy reports, etc. CD is an Intranet application that can only be accessed from a local VPN.

HUG is working on implementing a new Health Information System, namely the “HP HCIS”, an integrated Healthcare Information System developed by Hewlett Packard. HP-HCIS will be deployed in 2015 in 7 hospitals in the Madrid Region, while another 3 hospitals will integrate HP HCIS with the other Health Information Systems in their hospital. Moreover, the General Directorate of Health Information Systems of the Region in Madrid, which is responsible for the strategic orientations of the Regional Health Ministry, is working on the implementation of a visualisation system named HORUS. HORUS aggregates data from different Health Information Systems:

- administrative data from the platform that manages all horizontal aspects of health information such as the unique identification of patients or the administrative data of patients (named CIBELES);
- primary care information, stored in the OMI-AP and AP-Madrid services;
- and secondary care information, including secondary care reports extracted from the HIS of the hospitals (SELENE, HP-HCIS, DC, etc.) that store clinical reports and patient cases, digitalised reports or digital imaging (PACS, RIS) amongst others.

The earlier mentioned x-GPC (extensible Clinical Requests Manager, Gestor Extensible de Peticiones Clínicas) acts as a transaction manager, allowing the communication between the different Health Information Systems that are involved in the workflow of a clinical request. x-GPC is capable of integration with all Health Information Systems available on the market. Within HUG, this communication is standardised in the consultation request (Petición de Interconsulta, PIC). This document enables professionals from different units to share information about those patients who either require parallel care from different units or are being referred from one to another.

## **2.6 Governance and policy setting**

This continuous and coordinated care programme is included in the service programme offered by the University Hospital of Getafe to any patients who are considered eligible in the home visits programme. Nevertheless, the home visits programme provided by the CCU is not the common practice in the Hospitals in the Region of Madrid. Only 6 out of 37 hospitals in the Region of Madrid have a Geriatrics Service: the Ramón y Cajal Hospital, the Gregorio Marañón Hospital, the San Carlos Clinical Hospital of Madrid, the Red Cross Hospital, the La Paz Hospital and the University Hospital of Getafe. Newly created hospitals have geriatricians among their staff, but do not have proper Geriatrics Services. Among the 6 Hospitals that have Geriatrics Services, only 3 of them offer outpatient services.

CCU and the integrated care model have replicated the structure of the Red Cross Hospital in Madrid, adapting it to suit local conditions and models of care. There is no specific initiative from the SERMAS or the HUG leadership to support integrated care for elderly patients. The Geriatrics Service in the HUG launched the CCU on its own initiative and it manages the CCU from its own assets.

In order to achieve the objective of providing patients in the area with proximity of care, the HUG’s Geriatrics Service has set up a partnership with a set of local stakeholders. This local coalition comprises public health facilities (hospital-based and primary care), social care (both public and private), local authorities and representatives of older people.

Moreover, in order to implement innovative initiatives to improve the remote monitoring of patients at home, such as the HF Monitoring System tested in the pilot described previously, the Geriatrics Service has established cooperation with different public and private

stakeholders. For instance, HUG is collaborating with Saludnova, an SME from the Basque Country in Spain and other stakeholders to implement an initiative to assess the effectiveness of the use of a Personal Health System (PHS) for the remote monitoring of frail patients with diabetes. Along the same lines, the Geriatrics Service has recently promoted a study in cooperation with other hospitals with well-established Geriatric Services (two in the United Kingdom, two in Italy and two in Spain), to assess the effectiveness of implementing coordinated care programmes.

**Figure 4: Carelinehome, the system by Saludnova that supported the HF study**



## 2.7 Organisation and processes

The Geriatrics Service is a clinical service offered by HUG in order to treat older patients who suffer from any medical pathology. The Geriatrics Service consists of 1 Head of Service and 9 specialised physicians, 15 residents, 1 occupational therapist, plus nurses for the hospitalisation area, day hospital and consultation and administrative staff. The specialised physicians are organised into different areas of care:

- 4 physicians in the Acute Care Unit.
- 1 physician in Outpatient Office and Day Hospital.
- 1 physician in the Falls and Fracture Unit.
- 2 physicians in the Community Care Unit (CCU).

The Geriatrics Service established this care model to enable comprehensive management of the care of older people. The common aim of all sub-departments is the new paradigm for patient evaluation, focusing on functionality rather than on the traditional comorbidity-based approach. This theoretical framework is translated into practice by the generation of different coordinated care levels.

The CCU acts as a hub for coordinating the communication between all healthcare and social services that participate in the healthcare of older, frail in- and out- of hospital patients. Patients can be referred to the Geriatrics Service in two ways: after a hospitalisation following an acute event or following a request from the General Practitioner.

When an older patient is hospitalised after an acute event, the professionals in the Acute Care Unit start working immediately on the discharge plan. Besides all diagnostic and monitoring data, members of the Acute Care Unit gather information about the functional capacity of patients and their socioeconomic status (i.e. family structure, caregivers, etc.). Both sources of information are used to draft a discharge plan that includes an estimated date and a proposal for actions. In the days following the hospitalisation, discharge plans

for each patient are reviewed every morning by the professionals in the Acute Care Unit to assess the evolution of the patient.

The Geriatrics Service holds periodic meetings to discuss all discharge plans. A multidisciplinary team participates in these periodic meetings, which aim to cover all aspects of the future actions that will guide the health care of patients once they leave the hospital. The multidisciplinary team comprises members from the Acute Care Unit, from the Community Care Unit, from other levels of care in the Geriatrics Service and the hospital's social worker. In these meetings, both diagnostic and functional capacity parameters are considered. Moreover, the team also discusses to which service patients will be referred to after discharge, depending on the care they need and the availability of beds and professionals in the care network. Besides, in cases the reference hospital of patients attended by the CCU is not the HUG, remote meetings are held with professionals of their reference hospital in order to provide recommendations on care actions.

Finally, patients are assessed one last time by the Geriatrics Service staff before being discharged. At this point, patients are provided with a discharge report. In cases where the Geriatrics Service detects that patients have special health care, it contacts patients' GPs on the phone in order to share relevant information. Indeed, in the Spanish National Health System, GPs are ultimately responsible for patients' health once they come out of hospital.

There are no standardised criteria for referring a patient to the Geriatrics Service. Therefore, it is up to the GP to decide whether to make a consultation request to the Geriatrics Service. The lack of guidelines in this area can be a problem as older patients are often referred to the geriatrician only once they are in bad shape and at risk of developing or having already developed age-related disabilities. As a result, patients who could have benefitted from the continuous, coordinated care that would have helped them regain some functional capabilities may simply arrive too late.

## **2.8 Reimbursement model and economic flow**

The Community Care Unit initiative does not receive any dedicated funds from the hospital. All physicians in the Geriatrics Service are hospital staff and do not receive any incentives for participating in the CCU. Most of the equipment needed to implement the home visits has been paid for with funds from regional, national and European projects. More specifically, the pilot on remote monitoring for patients with Heart Failure was funded by the Health Research Fund (HRF) of the Carlos III Health Research Institute. The main objective of the Carlos III is to promote and support research initiatives in the health domain. The HRF tenders for research provide strategic support for the National Research Programme. Moreover, the Carlos III Health Research Institute is responsible for all activities in the Health Strategic Plan, which are part of the National Scientific, Technical and Innovative Research Plan 2013-2016.

In addition, the Sub-Division for Innovation of the Regional Health Ministry in the Region of Madrid runs a Public Procurement for Innovation Programme (PIIP), whose main objective is to foster technology transfer in different domains. The PIIP is a European Regional Development Fund (ERDF) that implements the National/Regional Research and Innovation Strategies for Smart Specialisation (RIS3 strategies). The National Ministry of Economy and Finance is responsible for distributing the funds between the different regional governments. Within the Region of Madrid, there are 3 main lines of innovation: Health, Education and Government. In the last few years, the health sector has received most of the funds of the PIIP programme. Hospital foundations, health institutes and universities

have created an environment that promotes research and innovation; hence, research production is significantly higher in health compared to other fields such as Education or Government. In total, 80% of the products funded by the PPIP belonged to the health domain. It is important to note that the PPIP is oriented towards the development of products that are commercially viable and ready for integration into routine practice. The most relevant criteria for eligibility are feasibility and competitiveness. PPIP funds are subject to the Procurement Law, and hence have to be completed within a 1-year timeframe. Furthermore, proposals have to include SMEs, mainstream manufacturers and health institutions such as research foundations or hospitals. The business sector benefits the most from PPIP funds, as they receive funding for developing their products. On the other hand, health institutions can benefit from PPIP funds, especially for the transition of new initiatives from research stages to actual clinical practice and their integration into larger systems. For example, the Geriatrics Service is currently preparing with the Regional Ministry of Economy a proposal to get PPIP financing. Moreover they will bid in another PPIP (along with hospitals in other ACs), promoted by the Spanish Health Ministry.

Finally, the Geriatrics Service is aware of the need for the CCU to produce economic benefits. The new model aims not only to provide better care and improve patients' clinical conditions and disease management, but it also seeks to reduce costs and become self-supportive. The Geriatric Service works with limited resources and every new initiative must be beneficial for patients and professionals, and profitable. Cost reduction is mainly achieved by lowering the average length of stay in the Acute Care Unit and reducing rehospitalisation of unstable patients.

### **3 Transferability**

The programme of continuous and coordinated care for older in- and out-patients was started by the Community Care Unit at the launch of HUG in 1991. Since then, the practice has been continuously updated, using the latest available technologies when appropriate. Moreover, the CCU has acted as a platform for benchmarking innovative approaches for remotely monitoring out-patients at their homes or at nursing homes. In order to implement these innovative approaches, the CCU has collaborated closely with other local stakeholders, such as other hospitals or SMEs.

The comprehensive, integrated care model implemented by the Geriatrics Service of the University Hospital of Getafe has adapted the integrated care model that has been functioning for a long time in other hospitals in Madrid, such as the Red Cross Hospital. The Red Cross Hospital was the first to implement this initiative, and currently has a unit for home visits comprising two cars with their respective drivers, two dedicated nurses and two geriatricians. Later, both the San Carlos Clinical Hospital of Madrid and the University Hospital of Getafe implemented similar initiatives, adapting them to their own capabilities in terms of available staff and financial capacity. As the same model of integrated care has been adopted – and adapted to their circumstances – by different hospitals, it can be assumed that other hospitals could easily implement similar initiatives.

Nevertheless, as with any innovative approach, the implementation of an initiative like the continuous and coordinated care programme faces two main hurdles: the need for funding and the involvement of professionals. As for the first hurdle, it can be difficult to secure funding for public hospitals, which usually have a closed budget and find it difficult to reallocate funds for initiatives outside their current practice. Depending on funds from

national and European projects imposes a management overhead and adds uncertainty, as it is not easy to get long-term funding from these projects. As for the second hurdle, each service in the hospital is usually bound to rigid practices, and generally professionals are reluctant to change these practices. Any innovative approach needs to be integrated with the current practice. If this is not possible, a special effort has to be made to minimise disruption, and the benefits of the initiative should be clearly stated so as to gain the support of all involved stakeholders.

## **4 Conclusions**

The structure of the Geriatrics Service in the University Hospital of Getafe promotes a comprehensive approach for the continuum of care for elderly patients. Patients are assessed according to functional criteria instead of the traditional comorbidity-based evaluation.

CCU is a home-based service that monitors the status of unstable patients after their discharge from the different levels of care of the Geriatrics Service, mainly from the Acute Care unit or Emergency Room, or upon demand from a General Practitioner or nursing home staff. Information about the visits is incorporated into the Geriatrics Service Health Information System and shared with primary care professionals who perform ambulatory care.

Older patients usually suffer from different comorbidities, which require them to be attended by different specialists. In order to provide patients with integrated care, it is necessary to establish collaboration between the different tiers of care. However, different levels of care or even different services at the same tier of care often follow strict protocols or practices, and in some cases are reluctant to change.

Geriatricians, nurses and therapists in HUG are well-trained to successfully implement the comprehensive care approach. However, physicians and nurses from other services do not receive any training, nor are they informed about the work carried out by the CCU. The lack of training in geriatrics can have some drawbacks, such as inappropriate referrals for patients who could benefit greatly from the services offered by the Geriatrics Service.

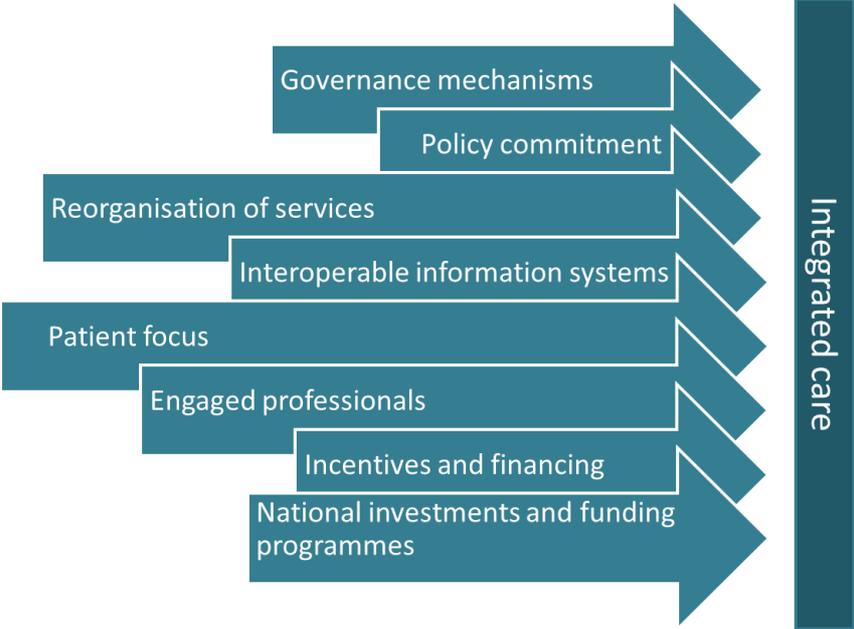
The integrated care programme for older and in- and out-patients has been demonstrated to have a positive impact on the health of patients of the Geriatrics Service. Geriatrics is not yet a top-valued discipline – as shown by the small fraction of hospitals in Madrid providing expert geriatric care, but practices such as the Falls and Fracture Unit and the integrated care programme implemented by the Geriatrics Service of the HUG have proved that they can improve the functional level of older patients and reduce the number of hospitalisations, hence saving costs.

Information and Communication Technologies can make a valuable contribution to the integration of care. The HF telemonitoring pilot carried out by the Geriatrics Service has demonstrated that remote monitoring solutions can have a positive impact on the health of patients. Moreover, the integration of Health Information Systems has allowed professionals from primary care to automatically access information about the patients gathered during the visits, enhancing care and reducing the paperwork. Getting up-to-date information on the status of the patients will allow general practitioners to provide patients with more accurate treatment and take more appropriate action.

The integrated care model in the HUG Geriatrics Service might easily be transferred and scaled up, as it does not require large investments, organisational nor legislative changes. Any system might implement a similar initiative as long as public support or other funding sources are present and professionals are willing to change the way they work.

As a final conclusion, Figure 5 shows the main facilitators (Villalba, Casas, Abadie, & Lluch, 2013) that characterise this case: patient focus and the reorganisation of services in place are the main drivers that have allowed integration.

**Figure 5: Facilitators towards Integrated Care in the case**



## References

- Orden del 11 de febrero de 1986, de la Consejería de Salud y Bienestar Social, por la que se desarrolla el Decreto 146/1985, de 12 de diciembre, de Centros, Servicios y Establecimientos Sanitarios (In Spanish). (2014, May 23).
- García-Armesto, S., Abadía-Taira, M., Durán, A., Hernández-Quevedo, C., & Bernal-Delgado, E. (2010). Spain: Health system review. *Health Systems in Transition*, 12(4).
- Ministerio de Sanidad, Servicios Sociales e Igualdad. (2014). Diferentes series de gasto sanitario (in Spanish). Retrieved from Portal Estadístico del Ministerio de Sanidad, Servicios Sociales e Igualdad:  
<https://www.msssi.gob.es/estadEstudios/estadisticas/sisInfSanSNS/pdf/diferentesSeriesGastoSanitario.pdf>
- Ministerio de Sanidad, Servicios Sociales e Igualdad. (2014). Informe anual del Sistema Nacional de Salud, 2012.
- Villalba, E., Casas, I., Abadie, F., & Lluch, M. (2013). Integrated personal health and care services deployment: experiences in eight European countries. *International Journal of medical informatics*, 626-635.



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